

Sustainable Innovation in the Cosmetic Industry—Obstacles, Contributing Factors, and
Strategies

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Dedication

This thesis is dedicated to my husband Shifa and daughter Lucy, without whom this thesis would have been completed one year earlier.

Abstract

This thesis research attempts to answer the question of “how companies can better compete in the market with their sustainable innovations?” using cases in the cosmetic industry. Key factors that contribute to the successful diffusion of sustainable innovations as well as obstacles that need to be overcome for a sustainable cosmetic company to thrive in an already saturated cosmetic product industry are explored. Strategies that help cosmetic companies better integrate sustainability into the core of their business strategies and managerial operations are suggested. Based on literature review, three main contributing factors: customer education, strategic alliance, and company image building are identified and illustrated in details. A survey and statistical analysis are performed to test the impact of customer education on customers’ decision in choosing sustainable cosmetic products and to study the importance of fourteen factors that contribute to a sustainable cosmetic company’s image building.

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1. Introduction

Our world today is challenged by the disrupting ecosystem concerns about how to utilize environmental and natural resources for accelerating industries in a more ethical way. More consumers start to restrict their purchasing behaviors to more socially and environmentally responsible consumption that saves energy, are eco-friendly [1]. Sustainability has become a source of competitive advantage for business and opens up opportunities for innovations. Research on sustainability has focused on the sustainable development issues in different industries, but seldom addresses the success factors and obstacles in the diffusion of sustainable innovations. This research, using the cosmetic industry as an example, tries to answer the question of “how companies can better compete in the market with their sustainable innovations?” by focusing on the challenges, key success factors and strategies to facilitate the diffusion of sustainable cosmetic products.

The thesis is organized in this way: chapter 2 reviews literature and introduces the definitions of sustainability, sustainable development model, sustainable innovation in general and the motives that drive sustainable innovations in the cosmetic industry. Given that regulation and normative standards play important roles in facilitating sustainable innovation in the cosmetic industry, chapter 3 presents the current regulation in “natural” and “organic” cosmetic products. The lack of unified sustainable cosmetic standards and the low customer awareness are highlighted in the end as the key challenges to

implementing sustainable innovation. Then in chapter 4, implementing successful customer education, creating sustainable company image and building strategic alliance are identified to help sustainable cosmetic companies achieve long-term success. Rationale and specific strategies for each component are discussed in details. Chapter 5 presents an empirical experimentation conducted through a survey and statistical analysis to test the impacts of customer education on customers' decision in choosing sustainable cosmetic products and to reveal the importance of the factors that contribute to a company image building. Chapter 6 concludes the entire study.

2. Literature Review

2.1 Definition of Sustainability

Sustainability is derived from the Latin *sustinere*. Sustain can mean “maintain”, “support” or “endure” [2]. Often bundled with the word sustainability is the concept of “sustainable development,” which was initially put forward in the “World Conservation Strategy” by IUCN (International Union for Conservation of Nature and Natural Resources), UNEP (United Nations Environment Program), and WWF (World Wildlife Fund) in 1980 [3]. The concept of sustainable development is an attempt to combine growing concerns about a range of environmental issues with socio-economic issues [4]. Since 1983, the United Nations World Commission on Environment and Development (WCED) uses the word “sustainability” for future related developments. WCED then produced the classic definition of sustainable development in 1987 as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs”[5].

For the definition of sustainability, different groups and organizations have their own interpretation. EPA (United States Environment Protection Agency) interprets sustainability as an action to create and maintain the conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations”[6].

At P&G, the world's largest consumer products company, sustainability means “making every day better for people and the planet through how we innovate and how we act.” They are achieving their sustainability goals through the commitment on environmental sustainability, social sustainability and product safety.

Sustainability at 3M means “protecting natural resources and empowering individuals and communities throughout the world to encourage progress.” It means balancing economic, environmental and social factors while addressing global challenges. And above all else, it means uniting under a common goal: improve every life.

2.2 Models of Sustainable Development

Definition alone is limited and difficult to depict how sustainable development can be implemented in a company. Building models can help gather, share and analyze information to get a better understanding of the concept. For sustainable development, several models have been developed and they are discussed below:

a. Three Pillar Basic Model

The most common model designed to understand sustainability and sustainable development focuses on the interdependent relationships between environment, economy and society, which are known as three pillars or three intersection rings of sustainability[7] [8, 9]. EPA also attached 6 broad to each pillar with related topics [10], as shown in Figure 1. Using this model, scholars often debate on the approaches aiming to balance these three pillars because of different types of values they present (e.g.,

biodiversity vs. cost, health and cultural values vs. profits, etc.). These three dimensions can mutually influence each other in positive as well as negative ways [8] and sometimes they are not directly commensurable relative to each other.

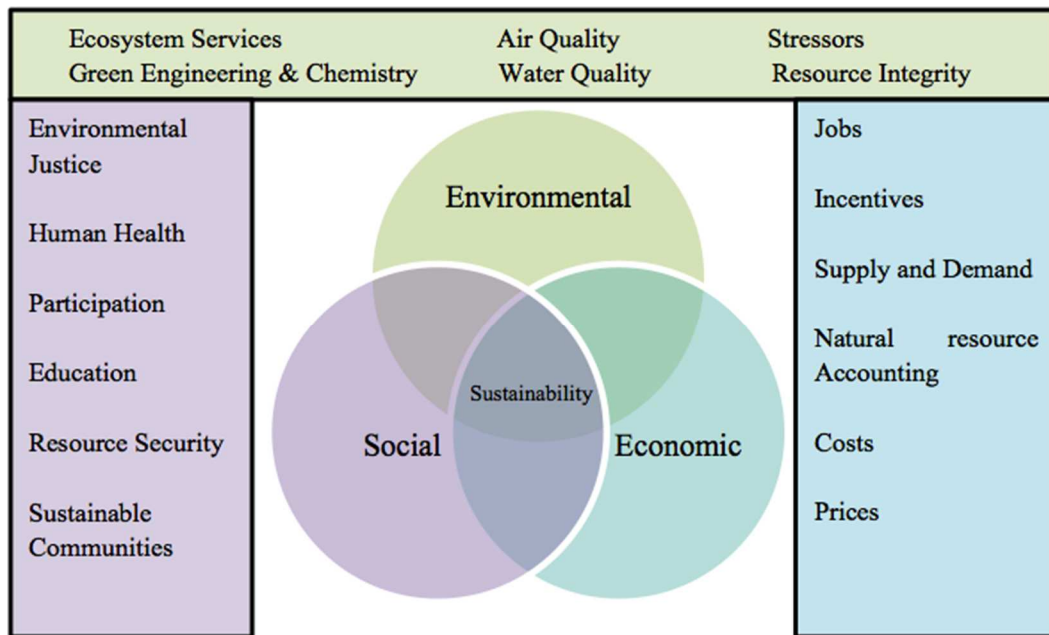


Figure 1 Three pillars of sustainability[10]

b. The Nested Cycles Model

The biggest debate on the ‘Three pillars model’ is the equal sized rings in a symmetrical interconnection, which leads to the assumption that there can be trade-offs. Giddings, etc. put forward another three rings model called “the nested cycles model”[9], whereas society and economy are nested in the environment, as shown in Figure 2. In this model, economy is not treated as the paramount aspect, but a subset of society, and both of these dimensions are bounded by and depend upon environment. They maintain that almost all

human activities are dependent on and impact upon the natural environment, while economy can be identified as a subset of society, because business, technology, production and exchange of goods are all in part based on social interaction[11]. This depiction of sustainability is considered to be more appropriate as “a conceptual outlook more sympathetic to integration”[9].

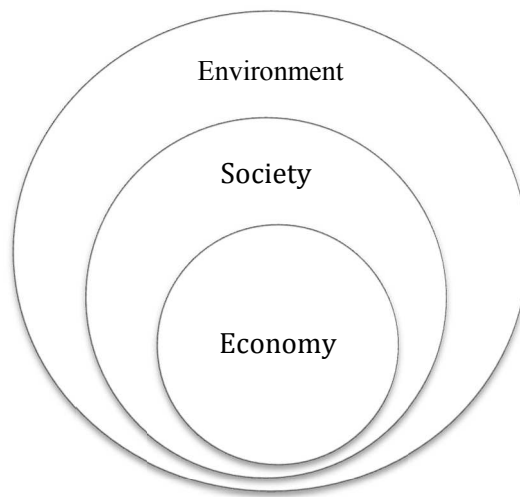


Figure 2 The nested model for sustainability[9]

c. The Egg of Sustainability Model

In 1994, the “egg of sustainability” model was designed by IUCN as an assessment tool to measure and achieve sustainable development goals [12]. Shown in Figure 3, it illustrates the relationship between people and ecosystem the yolk and white of an egg. This implies that the sustainability is that people well living in the ecosystem that one is dependent upon the other. Just as an egg is good only if both the white and yolk are good, so a

society is well and sustainable only if both people and the ecosystem are well. Thus the model can be translated into a formula:[13]

Sustainable development = human well-being + ecosystem well-being

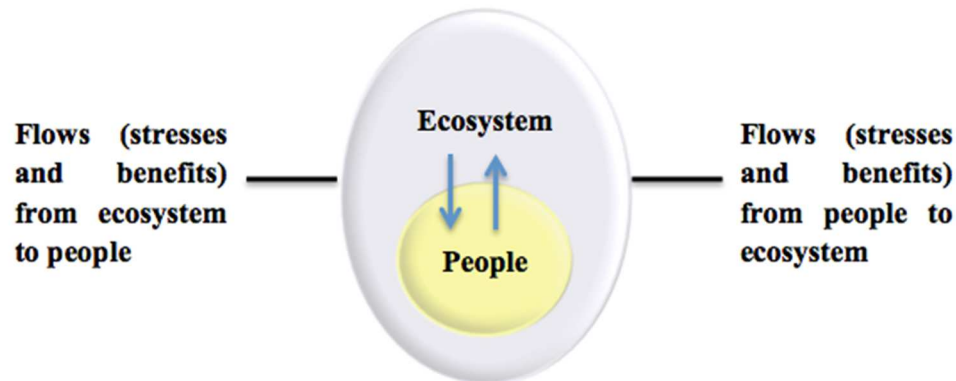


Figure 3 The 'Egg of Sustainability' model[12]

d. Other Models

Besides the above discussed models, other models have been developed such as The Prism Model [13], that are used to measure the overall vision of sustainable development. More pillars have been added to the sustainability model to represent aspects other than environment, society and economy. A well-known model in this category is an integrated four-pillared approach adopted at the Earth Summit, 2002 in Melbourne Australia. It is noted that “the fundamental objective of any sustainable community is the promotion of human well-being through enhancing both quality of life and quality of place”[14], so cultural is added as an additional pillar to the model. Moreover, innovation is also

considered as the fourth pillar by some scholars to be necessary to realize sustainability [15].

2.3 Sustainable Innovation

Innovation is considered as the key business strategy to drive economic growth, but it can also play a major role in tackling social and environmental issues such as chemicals abuse, environmental pollution, and natural resources shortages. Companies nowadays are facing growth limits because of various environmental issues. Challenges coming from the sustainable development of society and business imply increasing needs for more intelligent innovations. Sustainability related innovation or sustainable innovation was put forward to address this new wave of business innovation strategy to help understand the ways in which new technologies and social practices enable companies to become more sustainable. Sustainable innovation can be generally defined as: “coupling environmentalism’s protection of natural systems with the notion of business innovation while delivering essential goods and services that serve social goals of human health, equity, and environmental justice [16]”.

At the organizational level, the term sustainable innovation applies to product, service, process design, as well as company strategy [16] in order to come up with a marketable value proposition. The scale of innovation is also relevant [17]. Traditional approaches used to realize sustainable consumption and production like Eco-design and clean technology [18] can be classified as incremental innovations, because they are small scale to optimize existing products, processes and businesses. On a larger scale, disruptive

innovations are needed, because sustainable innovation indicates fundamental changes in economic life and society as much as in technologies and solutions[19]. It calls for a paradigm-shift in the mode of management and production[20]. Perspectives differ when evaluating which type of innovation contributes more to sustainability. Incremental innovation in product and business practices can steer economic activity onto a sustainable pathway when accumulated over time. However, more argues that real sustainable innovation should involve a change in socio-economic structure and in our relationship with natural environment, and only disruptive, radical innovations can change our unsustainable development patterns with higher environmental gains [18, 21].

Companies in different industries are embracing innovation through the full sustainability agenda including financial, ecological, environmental, and social health and prosperity and set it as the foundation to achieve long-term growth. This is especially true for giant companies: they have taken steps to incorporate the sustainability into the whole managerial practices.

Nike, the world leading sport apparel and equipment manufacturer, understands well of how thinking through the lens of sustainable innovation can help decouple the company's long-term growth from constrained resources. They not only innovate to a more sustainable palette of materials and chemistries, but also focus on improving the working conditions of factory workers and reducing the environmental footprint of manufacturing. They are making lean NIKE, Inc.'s manufacturing standard to deliver profitable growth through sustainable manufacturing and sourcing.

Philips, a Dutch technology company focusing in the areas of electronics, healthcare and lighting sets its core mission as to make the world healthier and more sustainable through innovations. Philips introduced the EcoDesign process in 1994, which considers all aspects of product development and design in order to develop “Green Technologies” and continuously reduce the environmental impact of their operations. The company also implemented energy-saving programs in its operational sites to help decrease CO₂. In 2015, Philips reduced its carbon footprint by 7% compared to 2014.

Besides Nike and Philips, an increasing number of companies such as L’Oreal, Google, BMW, 3M, and Coco-Cola are taking actions to implement sustainable innovation, and they believe such innovation can support product differentiation and generate sustainable competitive advantage. But how can companies be successful with sustainable innovation is a topic that still needs more research. Medeiros indicated [22] that there are important academic research contributions regarding the development of green innovation products and models capable of identifying and aggregating competences for sustainable innovation. However there is still ample room for research in this area.

Four main critical success factors for environmentally sustainable product innovation were identified in Medeiros’s research: market, law and regulation knowledge; inter-functional collaboration; innovation-oriented learning; and R&D investments [22]. Particularly, to illustrate the first factor, market, law and regulation, Medeiros mentioned that sustainable innovation depends on consumers who willing and able to acquire such innovations. Others indicate that one of the factors driving green innovation comes from

the influence of consumers [23]. But little research has been done to study how customer education can have impact on sustainable innovation. The importance of collaboration or strategic alliance in facilitating sustainable innovation is also studied in some research. Unlike the other kind of innovations that require a largely isolated process and carried out with considerable secrecy, sustainable innovation needs to become more open. Companies should leverage from the insights, capabilities, and support of others without compromising legitimate corporate secret [24]. Also they should strategically engage in the processes and activities to collectively build a favorable environment for their innovative sustainability technology [25].

Mainstream brand management literature often mentions innovation as a key element of brand positioning strategies, but rarely addresses the issue of why companies do not use brand as a key resource to drive innovation [26]. Perspectives on brands as guiding and constraining strategic resources for innovation processes can lead to sustainable competitive advantages [27]. The findings from Staub [28] strongly suggested that organizations should develop innovative strategies for sustainable performance, particularly regarding their corporate identify.

Sustainability is becoming an integral part of development [29], which forces the companies to change the way they think about products, technologies, processes, and business models. The key to process is innovation and smart companies now treat sustainability as the innovation's new frontier. Research shows that sustainable innovation leads to both bottom-line and top-line returns [29]. By being more sustainable

in operation and production, the companies end up reducing the inputs and lower the costs. In addition, the process generates additional revenues from better product and enhances the companies' brands.

2.4 Sustainable Innovation In the Cosmetic Industry

The cosmetics industry has seen the market's increasing needs to come up with a more sustainable solution to the cosmetic products, including ethical sourcing, green formulation, and minimizing negative manufacturing footprint on the environment, economy and society in general. Sustainable innovation for cosmetic businesses becomes a must and is motivated by the following four aspects (ethical imperative, regulation trend, technology, and companies' long term growth) organized in the research.

2.4.1 Ethical Imperative

With the large social demands on sustainability, ethical business, and environmental friendly behavior, more customers become environmental cautiousness and recognize that their purchasing behavior may have a direct impact on the environment and social communities. They are questioning corporate ethics by looking at the carbon footprint and ingredient sources of cosmetic products, and prefer products that meet high ethical and ecological standards [30]. Cosmetic consumers nowadays not only care about the natural or organic ingredients inside the cosmetic products, but also about the manufacturing process during the whole product lifecycle in order to know the adverse impact that may have on the environment when using the product that was chosen. If cosmetic products specially designed for the eco-minded consumers were market niche

ten years ago, nowadays with the demands of natural or organic cosmetic products growing in the market, sustainable cosmetic products that are both safe to the human body and friendly to the environment would change from the periphery market to the main stream. Eco-category is no longer the exclusive for the niche players. Sustainable innovation is the key to help cosmetic companies survive in this new market change trend.

2.4.2 Regulation Trend

Compared with the food regulation started since 1862 in U.S., shown in Figure 4, regulations for cosmetic products were far behind it, shown in Figure 5. The Cosmetic Ingredient Review (CIR) was established in 1976 as an independent safety review program for cosmetic ingredients, including the participation by the U.S. FDA and Consumer Federation of America. While the practical activities and regulations on natural and organic cosmetics was starting around 2008. With more consumers' demands for green cosmetics and their increasing concerns about hazard ingredients, the constraints of using potential hazard substances in cosmetic products and the rules to be able to label natural or organic cosmetic become even tougher. Although, a standard regulation is still not mature in the U.S. cosmetic market, government, non-profit organizations, cosmetic companies, and even consumers are taking actions to force a normative sustainable cosmetic regulation. Regulations not only represent constraints or regulatory compliance, but can also offer opportunities for reputation and economic growth, or even for new business creation [31]. Cosmetic companies have to be innovative, adjust their managerial strategies in order to seize such opportunity in the competitive market.

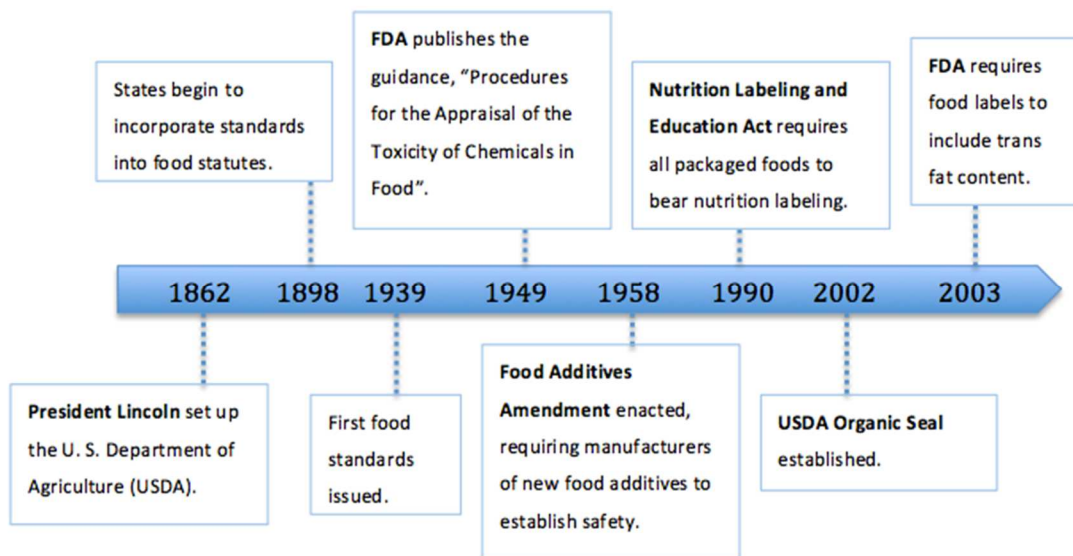


Figure 4 Historical line of food regulation in United States

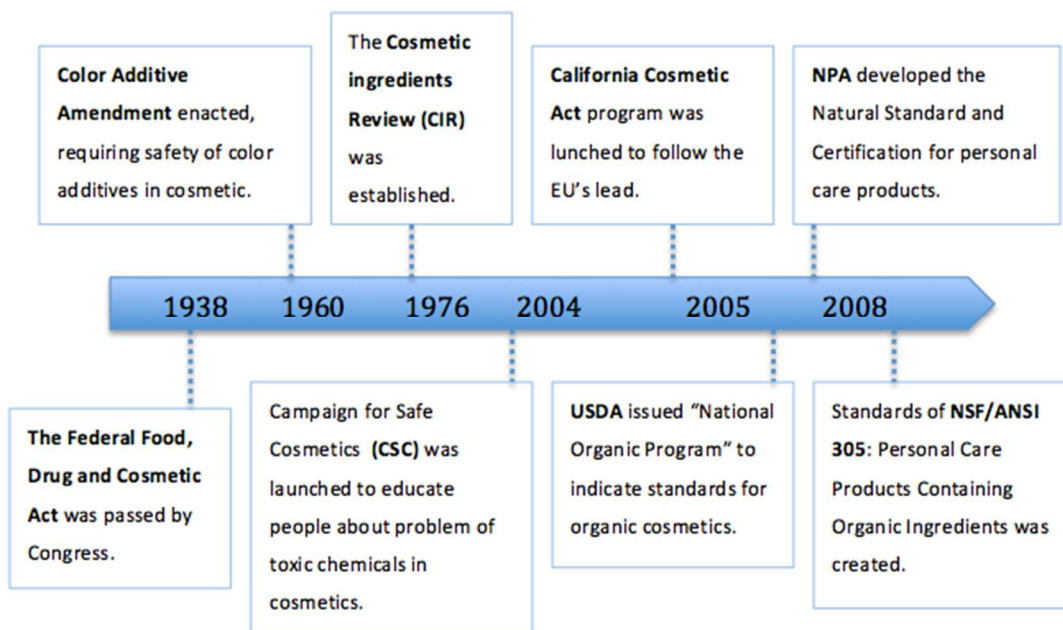


Figure 5 Historical line of cosmetic regulation in United States

2.4.3 Technology

As the knowledge grows exponentially and more cutting-edge technology exposed to the open world, the rate of innovation is forced to develop rapidly. According to the Schumpeter theory shown in Figure 6, we have experienced five innovation waves since 1785 [32], where typical technology push induced certain type of innovation. For example, the fifth innovation wave was introduced by the digital networks, software and new media at the beginning of 1990s, when networks, electronic products and IT industry developed rapidly since the past decades. Now we are moving fast towards the sixth innovation wave led by the sustainability, renewable/clean energy, biotechnology and green nanotechnology, when sustainable innovation will play an essential role to help cosmetic companies who has seized such opportunity succeed in a highly competitive and global knowledge driven economy.

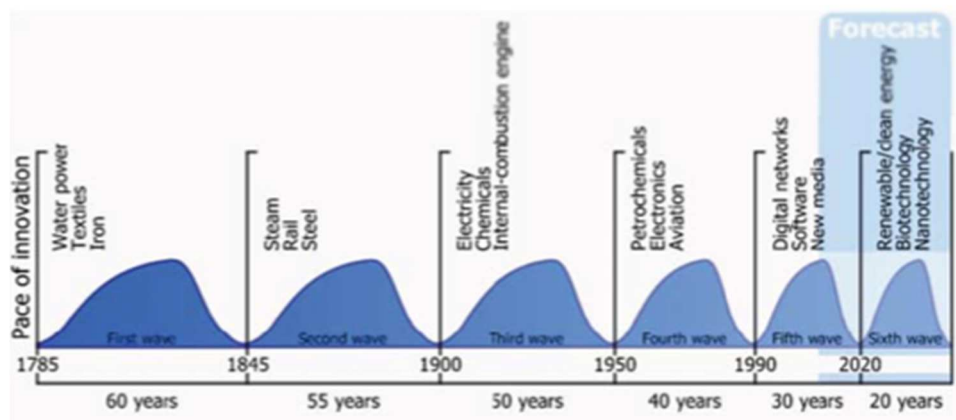


Figure 6 Sixth innovation wave[32]

“Green technology” or “Sustainability technologies” is used to address the sustainability related technology that encompasses a continuously evolving group of methods and materials, from techniques for generating energy to non-toxic cleaning products[33]. It enables more efficient use of resources, less stress on the environment. The emerging green technology such as, green building, green chemistry, and green nano-technology inspire the cosmetic companies to pursue more sustainable innovation. New raw material extraction method from natural resources and botany, advanced manufacturing process as well as the updated emulsification technique nowadays brings new ideas and opportunities to make the cosmetic products more chemical-clean and sustainable.

2.4.4 Economic Gain and Long Term Growth

Similar to the situation in the other industries, sustainable innovation in cosmetic companies can have a direct impact on the bottom line, which helps the companies lower business costs in the long run by reducing raw material and energy usage, as well as the waste. Doing business with sustainability helps companies to generate profitability by “doing more with less” [30]. By being more sustainable, company morale and company responsible image can be improved. Employees are more motivated if they are working in an ethical company and contributing to “good causes”, resulting in higher performance levels and greater staff longevity [30]. An incremental innovation in sustainability may bring cosmetic company short-term profit gain, however, sustainable innovation through the companies’ full business strategic agenda will generate long-term growth, including cost reducing, customer loyalty strengthening, and new business creating.

Current research in addressing how companies can be successful by sustainable innovation is quite few. This study will focus on the contributing factors that can facilitate sustainable innovation in cosmetic industry.

3. Current Situation in the Cosmetic Industry

3.1 The Misleading “Natural” and “Organic” Cosmetics

Rising education levels, the Internet and growing use of mobile devices are making consumers more informed than ever to realize the world we live is changing [30]. With the concept of sustainability embedding in nearly every aspect of human life, people begin to re-evaluate their purchasing behavior leading to a changing consumption patterns. Cosmetic Customers become aware of the harmful chemical ingredients inside the cosmetic products and are showing more preference to the cosmetic products that are made with “natural” or “organic”. Although burgeoning cosmetic companies have marketed their products as “natural” and “organic”, there is no law in the U.S. regulating what can or cannot be marketed as “natural” and “organic”[30]. Not few cosmetic companies claim and advertise their products as “natural” or “organic” but contain relatively low level of such ingredients in the products. Customers are then easily misled and take it for granted that the containing of natural/organic ingredients also occupy larger part of the whole product ingredients. Unlike multi-ingredient food products that certain rules have been published for all the food merchandise or producers on sale to reveal nutrition/ingredient facts on the external packing including the percentage. Cosmetic products make it more vague to just list all the ingredients one by one, while how much percentage of each ingredient included is unclear. It is unfair or irrational to claim the cosmetic products natural or organic even very low level of natural/organic ingredients is contained. Therefore, relevant standards and practical regulation are

becoming necessary and crucial with proper certification providing customers assurance that products meet certain level of "natural" and "organic".

3.2 Standards for Natural and Organic Cosmetic Products

There are no national or regional regulations for natural and organic cosmetics as there are for organic food. Different from food, drugs and biologics regulation, U.S. Food and Drug Administration (FDA) does not have the legal authority to approve cosmetic products and ingredients safe before they go on the market with the exception of color additives under the law[34]. There are three major standards - USDA/NOP, NSF ANSI 305 and NPA in the North America, their labels and full name are shown in Table 1. Among them, USDA and NSF developed the standards for "organic" ingredients, while NPA specifically regulates "natural" ingredients in the cosmetic products.

Table 1 Labels of three major standards

USDA United States Department of Agriculture	NSF National Sanitation Foundation	NPA Natural Product Association
		

USDA published the National Organic Program (NOP) in 2008 to address the missing standards for organic cosmetics, personal care products, and body care products. NOP regulation, 7 CFR Part 205 indicates that if a cosmetic, body care product, or personal care product contains or is made up of agricultural ingredients, and can meet the

USDA/NOP organic production, handling, processing and labeling standards, it may be eligible to be certified under the NOP regulation. Once certified, those products are eligible for the same 4 organic labeling categories as all other agricultural products, based on their organic content and other factors:[35]

“100 percent organic”--Product must contain (excluding water and salt) only organically produced ingredients.

“Organic”--Product must contain at least 95 percent organically produced ingredients (excluding water and salt).

“Made with organic ingredients”-- Products contain at least 70 percent organic ingredients and product label can list up to three of the organic ingredients or “food” groups on the principal display panel.

“Less than 70 percent organic ingredients”- -Products cannot use the term “organic” anywhere on the principal display panel.

According to NOP, USDA suggested cosmetic companies to look to these organic food regulations as their guidelines. However, organic food ingredients production techniques do not cover all areas of chemistry required for cosmetic ingredients and they go through different manufacturing processes. Under such circumstances, in 2009, American National Standard known as NSF/ANSI 305 was announced by NSF that defines labeling and marketing requirements for organic personal care products, While other standards exist, the NSF “contains organic ingredients” standard is the only American National

Standard for personal care products making organic ingredient claims. It is summarized as: “to become certified to this standard, products must undergo a thorough review by an independent organic certification organization to verify that a manufacturer’s product formulation contains at least 70 percent organic content by weight.”[36] Various processes and associated non-organic catalysts, as well as certain synthetic preservatives are permitted in this standard that are not allowed under the USDA/NOP 95% or 100% organic seal.

In 2008, NPA developed the Natural Standard and Certification for Personal Care Products, a set of guidelines that dictate whether a product can be deemed truly “natural”. NPA also illustrates the essence of its natural standard:[37]

- **Natural Ingredients:** A product labeled "natural" should be made up of only, or at least almost only, natural ingredients and be manufactured with appropriate processes to maintain ingredient purity.
- **Safety:** A product labeled "natural" should avoid any ingredient with a suspected human health risk.
- **Responsibility:** A product labeled "natural" should use no animal testing in its development.
- **Sustainability:** A product labeled "natural" should use biodegradable ingredients and the most environmentally sensitive packaging.

3.3 Challenges in Adopting Natural and Organic Standards

Although, multi-parties have taken actions to promote a more regulated standards on cosmetic products, the adoption rates of these three major standards remains low and the laws for "organic" or "natural" labels in cosmetic industry are not as rigorous as that in food industry. Cosmetic companies may register in the United States through FDA's Voluntary Cosmetic Registration Program (VCRP)[38]. It asks the manufacturer to file a product formulation with VCRP and FDA, which can help them identify non-permitted color additive or other prohibited ingredients, but as the name printed, the program is voluntary. Two challenges were identified in this research that need to be conquered in the path to a regulatory cosmetic world:

The first challenge is that there is no unified standard in U.S. to regulate cosmetic industry. There are three major standards and other standards from different organizations, although based on similar philosophy; the differences between standards remain significant, while no laws or special department of the government are responsible for that. It makes consumers more confused when selecting a certified cosmetic product. Moreover, in the existing standards, no rules there ask for cosmetic products to indicate the percentage of the "organic" or "natural" ingredients inside. Although a certified product has been attached the relevant label, ingredient facts are still unclear to customers.

The second challenge is the low customer awareness in those standards. The lack of regulation in the cosmetic industry does not call for adequate attention from the whole

society including cosmetic companies, manufacturers, suppliers and especially customers. Customers take it for granted that drugstore or department will guarantee the cosmetic products safe that are on sale, however, cosmetic products and ingredients do not need FDA premarket approval, with the exception of color additives under the law. Since cosmetic companies voluntarily choose whether to adopt a specific standard in their production, cosmetic companies will continue to abuse the term of “natural” and “organic” in their products. Customer education at this basis provides opportunities with sustainable cosmetic companies to help differentiate sustainable cosmetic products in the market. With more customer awareness arising through such education, it may become one of the incentives to drive the unified and normative standards.

4. To Be Successful with Sustainable Innovation in the Cosmetic Industry

Sustainability represents an important consumer need and is now an integral aspect of product quality, and it becomes part of brand value [39]. With the growing expectation that corporations be socially and environmentally responsible, how a cosmetic company greens up and becomes successful with sustainable innovations is a valuable topic. The purpose of chapter 4 is to understand how the cosmetic companies can facilitate sustainable innovations with proper business strategies and managerial operations. Based on the “Egg of sustainability” model discussed in section 2.2, a cosmetic product can be called sustainable if: 1.) It is sustainable for the users, meaning that it has no short- and long-term potential hazardous impact on the users; and 2.) It is produced from a sustainable production processes that is environmentally friendly and sources raw material, formulates, manufactures, packs, distributes, and markets the products in an ethical way. Three aspects, customer education, company image building and strategic alliance, are identified crucial in the research and will be elaborated in the following sections.

4.1 Customer Education

It is a major challenge for sustainable cosmetic companies to get their message of sustainability across to consumers and sustainable innovation calls for intensive new customer knowledge. Thus, customer education becomes the prerequisite to let customers be aware of the company initiative in sustainability. Customer education is more than just

propaganda and promotion; it calls for multi-background knowledge combination including the product itself and existing marketing. Pre-investigation in the cosmetic market and proper strategy would be helpful in implementing effective customer education. Nowadays, customer education is given more importance because it is believed to be a potential element to improve companies' performance [40-42].

4.1.1 Customer Education in General

However appealing the topic is, researches in the impact of customer education on companies' performance are quite less [43]. An early definition of customer education was proposed by Meer as: “ Any purposeful, sustained and organized learning activity that is designed to impart attitudes, knowledge or skills to customers or potential customers by a business or industry”[44].

There are other interpretations of customer education. For example Aubert refers to customer education as the extent to which firms provide the customers with product knowledge and skill [42]. Andreas indicates customer education involves the information and explanation service firms provide to their customers [43]. Regardless of how the customer education is defined, it is always related to making customers deeply understand what kind of product or service they purchase or will purchase.

From literature, companies implement customer education usually with three objectives:

1. To provide product usage related knowledge and skills to customers[45].
2. To positively impact customer product usage and buying decision[45].
3. To improve

customer satisfaction and brand loyalty then build long-term customer-firm relationship[42].

Most of the customer education research focuses on the service products, especially healthcare and financial service[40, 46], where more professional knowledge are required due to the complexity of these two services. Due to the close relationship with their health and assets, customers are unwilling to take risks. Rather, they are willing to be educated and make it a win-win situation for both the company and the customers. Customers can get better use of the resources and have the ability to judge service quality; companies gain trust as customers' knowledge increase and can also help to improve service satisfaction. Customer education in the service product should include informing customers about service-related concepts, and essential background knowledge, providing them with the abilities to use critical information, and explaining the pros and cons of service products recommended to the customers[43]. According to Aubert, to achieve better customer education, the company should first prepare customers for the service process by teaching them necessary skills to experience it. Then, company should provide customers with necessary knowledge to evaluate service quality[42]. Customers should also be taught the conditions under which a service can be best consumed.

For tangible products, customer education focuses more on training the customers to be more knowledgeable and skilled in using and maintaining the products, especially those

precise equipment and high-tech digital products such as medical diagnosis devices, vehicle, camera and electrical appliance. The study by Aubber has shown that the more a consumer perceives himself being knowledgeable and skilled on the usage of a product, the higher the usage situation and usage frequency of the product will be. The higher the level of knowledge and skills customers have about product usage, the higher the level of customer satisfaction with the product will be[42]. Customer education is different from expecting customers to learn through tools like the manual, user guide, or technical support online or by phone. For example, Nikon (Japanese multinational corporation headquartered in Tokyo, Japan, specializing in optics and imaging products) in France has initiated a unique approach on the French market to better implementing their customer education in an innovative way. They created Nikonschool, a training center that organizes and sells different types of lectures, seminars and workshops on a wide variety of topics in order to help customers get the most use of their products [42].

Although customer education has its own advantages, many established firms are hesitated to implement their own customer education because of several risks they can foresee. Firstly, customer education needs time, money and energy investment to change the existing product image and service process, with the concerning of whether such investment would pay off [43]. Secondly, firms fear that once customers are equipped with knowledge, skill and expertise from the education, they will have the ability to identify better product and may switch to the competitors; customer loyalty will be decreased in this case [47]. However some other research believes that those risks

become less important compared to the trust built between customers and company under customer education[48].

4.1.2 Customer Education for Traditional Cosmetic Products

Cosmetic products are a special kind of consuming products. When customers choose self-service purchasing, including the supermarket and on-line shopping, customers just purchase the product itself. While purchasing in a department store or from special beauty retailers with specific counter, customers not only buy the product, but also buy the service of communicating with the beauty advisor and being introduced to or being taught the usage of the products. Thus, customer education in the cosmetic industry should combine both service area and tangible products.

However, traditional cosmetic companies only focus on training their customers in the simple skills to use the products. For example, it is common to find a usage instruction on the facial clean product as: “1. Wetting the face. 2. Squeeze the tube. 3. Add water and work the cream into a dense, foamy lather. 4. Massage your face, concentrating on the nose, the chin, the forehead. 5. Splash on water to rinse clean.” (DHC Pore Face Wash) Customers may also be suggested on when and how to use their product to maximize the working effects such as using after sun burn, applying during the night, or combining use with the other products in the same brand. To some high-end cosmetic brands, in order to introduce their products, scientific or biologic knowledge that is related with aging skin, or other reasons causing problematic skin would sometimes be illustrated to the

customers. After equipping customers with the basic background knowledge, customers are expected to accept the products that typically treat the skin they are concerned about. For example, the Estee Lauder Advanced Night Repair Serum is well accepted among customers may be owing to the scientific effects. Its promotion aims at educating their customers that it is DNA damage that causes skin to age at fast speed, and the exclusive ChronoluxCB technology in the serum is just the scientific solution to address all key signs of visible aging at the DNA level.

Beauty customers usually welcome scientific knowledge that helps explain their skincare concerns. With such knowledge customers gain more trust of the product and become easier to understand the benefits of the product to adopt it. The higher the level of knowledge the customers perceive, the more they believe in the product effectiveness. Besides the usage instructions and critical information on the outer packaging or promotion brochure, direct communication with the beauty advisor or consultant at the point-of-sale is another common way for cosmetic companies to educate their customers on the usage of their products. This is especially for makeups; providing professional instruction on the usage of the products or giving the customers an on-site make-up lesson is an important marketing strategy.

4.1.3 Customer Education for Innovative Sustainable Cosmetic Products

When it comes to new and innovative cosmetic products, customer education becomes even more essential and complicated. Those potential risks of customer education that are considered threatening the customer-firm relationship in traditional products may

represent opportunities for an emerging innovative product. The innovative product's basic concept should get across to the customers in the most easy and conspicuous way, so customers can identify it at the first glance. Then sustainable cosmetic companies should differentiate it from traditional or existing products. Since it is innovative, the product's uniqueness and new benefits that it can provide for customers should be unveiled, within which, some professional concepts or words may occur. Therefore educating customers becomes necessary to make customers better understand the product.

Sustainable cosmetic products attach more health concerns than traditional ones. In general, cosmetic companies usually focus on the benefits and special functions their products can provide for customers, while seldom let customers know details on the product ingredients. As a result, customers do not pay attention to the composition of cosmetics. Different from other cosmetic companies that only broadcast what active ingredient are contained in their products, sustainable cosmetic companies can emphasize on their products do not contain. For example, quite a lot of natural or organic cosmetics including skincare, makeup and hair care products pronounced being free from Parabens- commonly used preservative in cosmetics that has been proved to cause hormonal disruption and link to breast cancer. Critical information about known harmful ingredients including synthetic chemicals and toxic natural ingredients should be transferred to the customers, which in turn calls for an increase in the level of customer knowledge in the sustainable cosmetic market. Customer education for the sustainable

cosmetic companies needs to ensure that certain key information is accessible to their customers.

4.1.3.1 Composition and Formulation of the Products

In United States, Federal Food, Drug, and Cosmetic Act of 1938 has been amended, “To protect consumers from unsafe or deceptively labeled or packaged products by prohibiting the movement in interstate commerce of adulterated or misbranded food, drugs, devices, and cosmetics.” **(21 U.S.C. 321-392)** Fair Packaging and Labeling Act regulates, “To ensure that packages and their labels provide consumers with accurate information about quantity of contents and facilitate value comparisons.” **(15 U.S.C. 1451-1460)**

It is law in United States to provide a list of ingredients on labeling for all cosmetics marketed in the States, regardless of whether they are manufactured here or imported from abroad. Since the ingredients list is always available to customers, education for sustainable cosmetic companies can focus on training customers to identify and avoid hazardous ingredients, like some synthetic chemical preservatives that are believed to causing hormonal disruption. On the other hand, besides letting customers know certain hazardous ingredients to avoid, positive information can also be transferred to customers to help them identify natural and non-hazardous ingredients. In addition, the customers can be taught that not all the natural ingredients are safe to skin, and not all the synthetic ingredients are bad. The truly sustainable cosmetic products are those that can bring

benefits to the skin or treat certain skin problems while not causing additional problems to the human bodies like allergies, irritations or toxicity in the long run.

4.1.3.2 Undesirable Effects

Customers usually want to know the material effects of the cosmetics they use, to ensure it is a healthy and non-problem-causing product. Therefore, besides training the customers to identify certain hazard ingredients, customer education should also help the customers understand the undesirable effects that may be caused by some hazardous materials.

Sec. 201(n) of FD&C Act indicates that, “Labeling may be considered misleading not only because a label statement is deceptive but also because a material fact is not revealed on a label.” With the FDA regulation by law, cosmetic companies are required to post a warning label on the products that have not been assessed for safety, however, most cosmetic companies fail to adhere to this law and one can rarely find a “warning” tag on the cosmetic products that reveals some undesirable effects caused by certain ingredients. Most cosmetic companies would not put such a tag to warn their customers to be carefully using their products but as a sustainable cosmetic companies, revealing undesirable effects and potential side effects cause by certain ingredients is responsible for their customers and a manner to live with their sustainable claims.

4.1.3.3 Current Regulation for Cosmetic Products

When choosing sustainable cosmetic products, customers may be easily misled by the “Greenwashing” practices, which are defined as “when a brand or company makes efforts claiming to be green and natural through advertising and marketing rather than implementing practices that minimize environmental impact [49]”. Such tricky subject blows smoke to make it even difficult for customers to find real sustainable cosmetics. Hence, the current regulation and status quo of the cosmetics in the existing market should also be considered as an important part of customer education, especially basic rules and related standards in regulating natural and organic cosmetics. Customers should be more sophisticated in choosing cosmetics; Sustainable cosmetic companies should develop proper customer education strategies to help customers distinguish certified natural or organic cosmetics with those self-claimed, so-called natural or organic cosmetics.

A major finding from Organic Monitor (2011) [30] that undertook research on the ingredient lists of cosmetic brands that had products marketed on their natural/organic features was that most brands studied especially those outside Europe did not live up to their marketing claims. They use a number of synthetic ingredients that are not commonly accepted in natural or organic cosmetics, which were classified as semi-natural or “naturally inspired” although consumers may perceive them as pure. Also, according to a panel from the Natural Products Association (NPA), as few as 20% of the products in the natural personal care products sector are truly green [50].

Because customers lack the knowledge and the ability to distinguish authentic natural or organic cosmetics, they easily buy those green claims, and this put true sustainable cosmetic companies in a disadvantageous position. Eco-labels provide powerful ways to break the challenge. Sustainable cosmetic companies can build alliance with the third-party by issued relevant labels. While letting the customers know the meaning of eco-label attached to the products can help to gain more trust and build long-term loyalty.

4.1.4 Implementing Customer Education

Customer education can be defined not only by its objectives but also by the way companies implement it [42]. It is closely related to a company's customer knowledge management. A look at how knowledge transfers from company to customers will be helpful in implementing customer education. Such information is normally effectuated by marketing tools, especially by the planning of promotion decision and product value description.

Honebein suggested that a company can provide educational experiences throughout the company's relationship with customers [45]. Two stages of purchasing behavior were identified to develop different strategies in implementing customer education: the pre-purchase stage and post-purchase stage [42]. With this model, how customer education

can be successful implemented by sustainable cosmetic companies are discussed next in two stages.

4.1.4.1 Pre-purchase stage

For sustainable cosmetic companies, at the pre-purchase stage, customer education could focus on giving potential customers the knowledge and skills necessary to increase their awareness and understanding of the sustainable product, including making the customer aware of the certified green labels, the potential toxic chemicals that the products are free from, and the low impact on the environment from its manufacturing processes and sourcing the products of materials. Furthermore, another purpose of customer education at this stage is to give potential cosmetic customers self-confidence in using the products. Data from Natural Marketing Institute show that one of the barriers to green purchase is that customers doubted on the green products' effectiveness as compared to the traditional ones [41]. Effective advertising and direct communication at the point-of-sale are commonly used. In addition, more strategies and tools are suggested below for sustainable cosmetics.

a. Digital Innovation

Sustainable cosmetic companies should take full advantages of the digital innovation and the wide use of electric devices by customers. Since one of the biggest challenges for sustainable cosmetic customer education is a vast b. of information to show versus the limited access customers can get to. QR codes can be a solution here. When customers

use their electric devices to scan the QR code attach to the cosmetic product, information related would be well displayed on their devices to elaborate on ingredient inside, eco-labels information bundled with the product, or even a short video recorded where the raw material were sourced. Further more, to increase the trust of customer in the product claim, QR codes can also be linked with the “SkinDeep” electronic cosmetic database, where safety profiles for cosmetics and personal care products are shown with the hazard score of the product and ingredients included.

b. Partnering with Environmental Groups

Establishing a partnership with environmental groups is considered as an effective strategy for businesses and government to improve their environmental sustainability. While there are other activities environmental groups can do, educating customers with the sustainable products related knowledge is part of it. The National Environmental Directory reveals a directory of more than 13,000 organizations in the U.S concerned with environmental issues and environmental education. Sustainable cosmetic companies should establish strategic alliance with proper environmental groups, which can help them with customer education in sustainable cosmetic related information, such as harmful ingredients, natural and organic cosmetics standards, and even sustainable sourcing knowledge. This part will be further discussed in section 4.3.3.

4.1.4.2 Post-Purchase Sage

At the post-purchase stage, the main objective is to support customers in their use of the products and help customers build long-term sustainable purchasing behavior of cosmetics to reinforce the customer relationship. One of the effective practices is to engage consumers through campaigns and forums, similar to Nikonschool mentioned in section 4.1.1, Customers could establish membership with the company, and communicate with the company or the other members to get further understanding of the products. It is possible that sustainable cosmetic companies set up their own company APP to keep in touch with their customers by frequently updating sustainable cosmetic knowledge, industry regulation information, as well as the socially responsible activities that the company have been involved.

4.1.5 Summary

Cosmetic customers want to make sure their shopping choices line up with sustainable values. They are receptive to efforts by marketers to provide them with the information they need to make informed purchasing decisions [51]. Sustainable cosmetic companies in turn should provide customers with educational messages to make their products' and environmental benefits tangible through easily acceptable illustrations. Effective customer education can not only reinforce the firm-customer relationship, build long-term loyalty, but also improve the competitiveness with other cosmetic companies. Furthermore, customer education can help to improve the positive communication

between companies and customers, which helps companies get more positive feedback. Positive and effective feedback from customers is always considered an essential way to improve the company performance.

4.2 Company Image Building

An image of a company being sustainable is more than making green products. Image building consists of a series of good practices that work together in harmony. An increasing number of astute executives recognize company image and reputation as critical corporate assets directly linked to competitive success [52]; these intangible assets may provide companies with a more enduring source of competitive advantage than their patents and technologies [53]. For the companies that pursue sustainability and want to develop sustainable businesses, company image is no longer simply equivalent to company identity or management of the brand reputation. It is everything throughout their business strategy – from why they exist, what they sell, to the relationship with customers, environment and the society. Building the right image is very important for sustainable cosmetic companies, as they have a core value for sustainability. The target customers are the ones who want to beautify their appearance with skin-friendly ingredients. This group of customers may also care about whether manufacturing process and the use of the products would have negative impact on the environment. Attractive aesthetics and pleasing perception of the company and brand will enhance customers' belief in their products.

4.2.1 Company Image Building in General

Company image building can be related to “Corporate Aesthetics Management” (CAM), defined by Schmitt strategic framework for “managing a company’s full range of visual output in the form of products, logos, packaging, buildings, showrooms, ads, etc.” [54] Gray and Balmer put forward a pragmatic operational model for managing corporate reputation and image, as shown in Figure 7 [52]. According to their model, “corporate identity” and “corporate communication” are two key essential processes to achieve “corporate image”. It should be noted that, company image is different from company identity. Company identity is the company’s self-presentation, which means how the company perceives itself. It consists of a company’s defining attributes, such as its people, products and services. However, company image is how the company is perceived in the market by the outside organization. It is a reflection of a company’s identity [55].

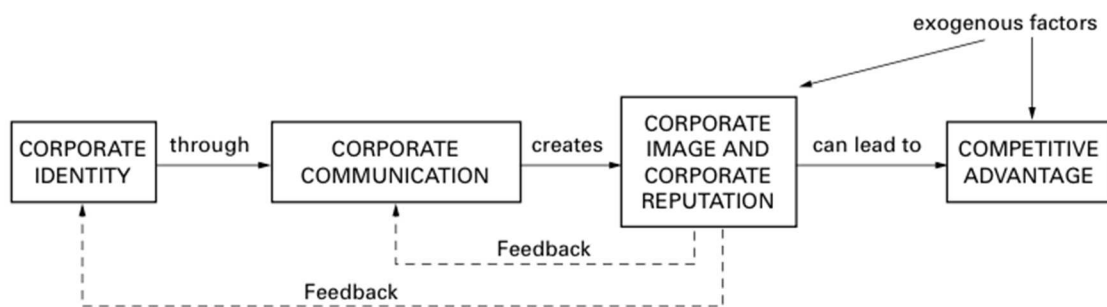


Figure 7 The operational model for managing corporate reputation and image[52]

As depicted in Figure 7, through a variety of effective corporate communication, corporate identity can be effectively conveyed to the market and multiple stakeholders, thus creating the corporate image among them. Corporate image and reputation in turn

give feedback to the corporate identity and corporate communication to help the company make proper adjustment; such a looped process can lead to competitive advantages for the corporation.

By building and managing company images, several objectives can be achieved from the research and they include:[52, 54]

- 1.Enhance the impact of marketing communication, which provide powerful ways of differentiating products, and simulate purchases.
- 2.Help to create good reputation and lead to competitive advantages.
- 3.Provide a supplemental lens through which top management can view and address the strategic issues facing the company.

4.2.2 Sustainable Image Building for Sustainable Cosmetic Companies

Yvon Chouinard, an environmentalist and the founder of Patagonia, a gear and clothing company, suggested that the reason why companies were not great at sustainability and building trust is because they are not “authentic to begin with” [56]. Not all cosmetic companies are originally built with a sustainable concept. Only reformulating a cosmetic line with a purpose to keep up with the trend of sustainability is far from enough to shift customers’ minds on sustainable branding. Company image is the integrated perception of a company received by customers and the market, not only including the products and services, but also the transmission of the company’s philosophy, culture and marketing strategy. Establishing a good image for a sustainable cosmetic company will contribute greatly to the success of its products promotion.

For sustainable cosmetic companies, building a strong sustainable image can:

1. help to create good company reputation and improve brand loyalty.
2. gain more trust from public and improve the company's claim credibility, thus simulating purchase.
3. enhance the impact of marketing communication, and provide powerful ways of differentiating brands and products.
4. help them facilitate customer education.

To better facilitate sustainable cosmetic company image building, an improved operational model is derived from the Gray and Balmer model presented in Figure 7 in this research as shown in Figure 8, specific areas are added to “company identity” and “company communication” in the framework.

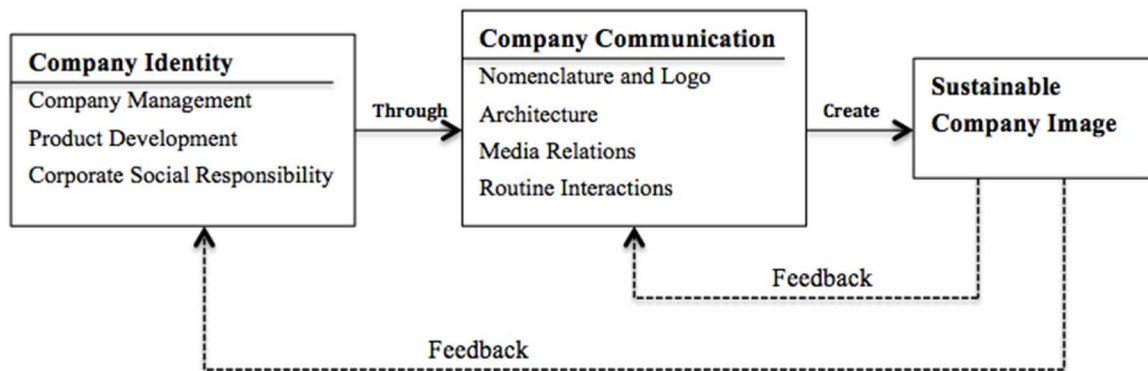


Figure 8 An operational model for managing sustainable cosmetic company image

Next, the model is further explained with more details.

4.2.3 Company Identity

As shown in Fig 8, building of company image starts from the company identity. As mentioned before, company identity is a company's self-presentation; it represents the reality and uniqueness of a company, composed of the company's philosophy, culture, and organizational design [52], as well as the products and service it provides. Company identity is all that the company can and wants to exhibit to the market. Cosmetic companies searching for sustainability should re-think the factors that contribute to their company identity, including the managerial practices and the product development. A final factor stimulating more current interest in company identity is Corporate Social Responsibility (CSR). Many consumers begin to pay more attention to companies' environmental and social image as part of their purchasing decisions.

4.2.3.1 Company Management

Although customers will not see the managerial efforts made behind the products and services they purchase, the internal company managerial strategies and engagement do influence the company identity for sustainability by redefining the philosophy and product line, reshaping the corporate culture, thus impact on the customers' perception of the company and their products. Better integration of sustainability into the core of managerial strategy and operations will help shape a sustainable business. Leadership commitment and employee engagement are considered as two key components in company management [57].

In general, it is the top-level executives that have the ability to create an enterprise-wide vision. Only when the leadership commitment drives the process with the goal for sustainability, building a sustainable company identity can truly get started. Different from the leaders of traditional companies, the top-level leaders of sustainable companies take a long-term view when making decisions and they are more knowledgeable of the issues pertaining to sustainability [57], such as waste and energy management practices. Effective communication from the top leaders plus their personal commitment to sustainability inspires others throughout the organization. As a result, leaders from sustainable companies can better integrate sustainability considerations into basic business decisions, ensure the consensus about the sustainable direction where the business is heading, and establish a high-involvement organization.

Robert Eccles defined the employee engagement as “actions a company takes to secure the interest and attention of employees in their sustainability efforts” [57]. Sustainable development of a company cannot be achieved without individuals changing behaviors, as a result, personal engagement of employees is crucial. Company leaders should embed sustainability into the corporate culture and create organizational structures that support sustainability. Therefore core sustainable values must be clearly defined, understandable, and realizable so that every employee can live those values. Social exchange theory (SET) posits that individuals are likely to reciprocate based on what they receive [58]. The more understanding from the employees they have on the company’s sustainable efforts, the more engagements they will have to help company achieve the goals. A

supportive corporate culture can provide more flexible conditions that motivate sustainability related innovation. As a result, the leadership commitment and employee engagement reinforce each other to boost a more sustainable corporate culture.

Weleda Group, a leading manufacturer of natural and organic cosmetic in Switzerland with more than 2000 employees around the world is a good example to demonstrate how the concept of employee engagement is applied to real managerial practice. Weleda was founded with sustainability based on the principles of ecological, social and economic responsibility. One of the seven core values of Weleda is “management-employee relating in a spirit of partnership,” in which the company emphasizes the employee’s personal responsibility, ethical and value-creating business practices. To ensure that employees are familiar with its philosophy, Weleda offers management seminars and training programs; such as the “Weleda identity and basic values curriculum,” which provides a basic introduction to Weleda’s corporate culture.

Company management is the core of any business and an important way through which sustainability can be delivered to the whole organization. Sustainable cosmetic companies integrate sustainability into the core of their managerial strategy and operations instead of greenwashing their products.

4.2.3.2 Product Development

According to the model shown in Fig 8, product development is the second area contributing to company identity. Product manufacturing and development may seem to

be irrelevant to a company's identity, since what the customers get and see is the finished products. The logo, packaging and effectiveness of the products are those that really matter. But the truth is that consumers are increasingly favoring brands based on their track records for managing product life cycle [39]. They care about where the raw materials are sourced, how the product was manufactured, whether the processes had negative impact on the environment, etc. For example, Lush—a famous handmade cosmetics company with its unique roots to produce handmade cosmetics, makes its producing transparent to customers through its digital strategy to share the manufacturing processes and ingredients behind the products on the site. Such integrated vision of sustainability for customers definitely adds more values to the company identity.

A life-cycle assessment (LCA) is a method to help examine all environmental issues involved in a product's life from cradle to grave. As shown in Figure 9, through the assessment, a full range of environmental effects can be assigned to products and service, and processing efficacy and strategic decision making can be improved. It is not a must for customers to understand the complex LCA data, however a key purpose of performing life-cycle assessment is to get their sustainability efforts across to the customers. This section mainly discusses how each phase in the product life cycle adds value to the company identity.

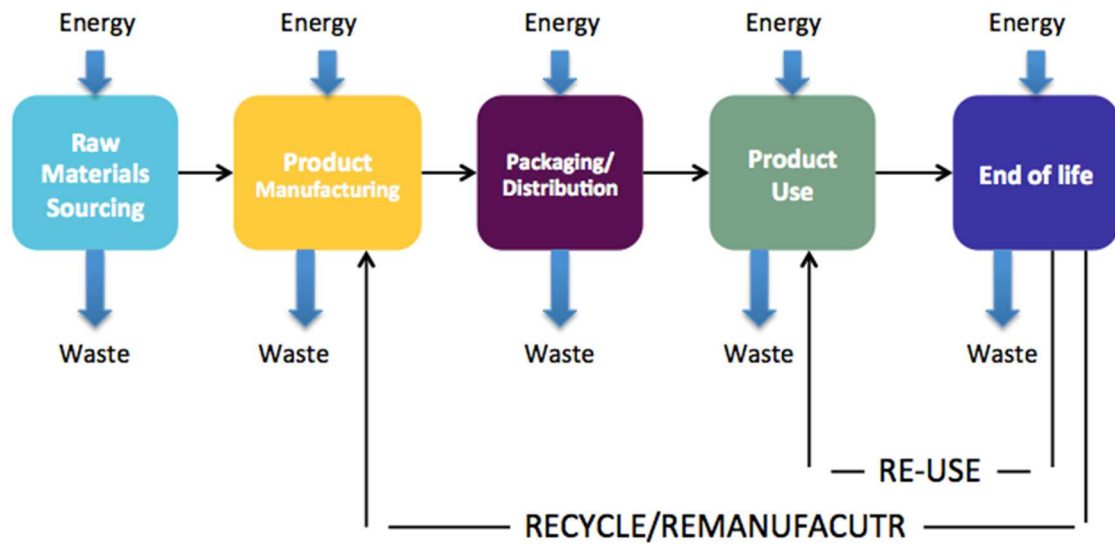


Figure 9 Product life-cycle assessment model[59]

a. Raw Material Sourcing Stage

Raw material is an important part as the start point of product life cycle. For customers who caring about sustainability, they demand to know not only what the raw materials are, but also where they came from and how they were acquired. Sustainable development for cosmetic companies needs to maintain sustainable when selecting raw material on both the users' side and the providers' side. Firstly, raw materials chosen to formulate final cosmetic products should be safe and non-toxic, which means they will not cause undesirable effects or harm the wellness of human body in the long run. Complex synthetic materials are always associated with potential health hazards and that's why sustainability for cosmetic companies means using natural and organic ingredients. However, not all the natural and botanic based ingredients are safe. So carefully studying and selecting raw material is one of the most challenging and important issues facing sustainable cosmetic company. Secondly, being sustainable for

the providers means ethical sourcing: sourcing raw materials in ways that preserve the environment and safeguard the efficient use of precious resources. In fact, more cosmetic companies have made commitments to reduce their environmental footprints by the use of green formulations. For instance, L'Oreal has pledged to only use new ingredients that have a lower environmental footprint than the existing ones. Also, ethical sourcing includes fair trade that focuses on protecting natural habitats for sustainable use, improving quality of life and ensuring them a sufficient income for local people.

Sustainable cosmetic companies in general develop partnerships with qualified suppliers worldwide, seeking alliance with external expertise to make the natural and organic ingredients available. Beraca founded in 1956 in Brazil, is now a leading provider of natural and organic ingredients from the Amazon rainforest and the other Brazilian biomes to more than 40 countries. Kiehl's is one of Beraca's clients that sources its organic açai berries from the Nazarezinho community of açai farmers. Beraca promoted a closer relationship between the community and Kiehl's. It also trained the community on business management, organic certification and post-harvesting practice. By doing so, Beraca acted as an organizational and business supporter for the local farmers as part of company's sustainable efforts.

Sourcing raw materials from qualified sustainable suppliers like what Kiehl's does not only help the company to secure sustainable sourcing, but also help the company gain more benefits through its strategic alliance with those suppliers. Customers, especially

those green buyers, are willing to choose the cosmetic products made from the ingredients that are more responsible for human beings including environment and society. Ethical sourcing of raw materials adds more responsibility but also credibility to a company identity.

b. Product Manufacturing Stage

The manufacturing process in the product life cycle is the stage that can cause the most impact on environment. Sustainable manufacturing processes for cosmetic companies can help reduce energy consumption and better waste management. It can also provide opportunities to improve the effectiveness of the cosmetic products in some cases. For example, the two commonly used methods to extract essential oils are steam distillation and cold pressing methods. Rather than the requirement of external heat to run the steam distillation process and later on cooling process, cold pressing method does not involve any solvents or heat of any kind. Using the cold pressing method does not only save energy, but also better preserve effective ingredients in the essential oils extracted to provide high quality products.

In fact, more cosmetic companies have begun to integrate their production and incorporate sustainability into the whole manufacturing process. The core issues including waste minimization, pollution prevention, minimizing the use of toxins and the release of toxins to open environment are being addressed. Two examples are presented below to illustrate their integrated sustainable manufacturing process.

Amore Pacific is one of the biggest cosmetic companies in Korea. Under the concept of “Vertical City for Man, Machine and Nature”, Amore Pacific’s Beauty Campus Shanghai manufacturing center was founded in October 2014, featuring the highest level of production, research, distribution and eco-friendly environment in the Chinese industry [60]. Based on Amore Pacific’s sustainable management philosophy, the building of the center was designed to save energy and protect the environment by applying advanced eco-systems such as photovoltaic power generation, a chilled water storage system and efficient equipment. A new LNG gas system will reduce CO₂ emissions by 146 tons and save up to 970,000 CNY (approximate to \$149,518) yearly.

The other example is Aveda. As the first beauty company manufacturing with one hundred percent wind power, Aveda has already promoted a head start in cosmetic industry for sustainable manufacturing. The mission at Aveda is to “care for the world we live in, from the products we make to the ways in which we give back to society.” They believe that there is no responsible alternative to doing business other than through the pursuit of environmental sustainability and this belief guides every decision they make. Aveda is also labeled with the MN Star Worksite by the Minnesota Occupational Safety and Health Administration (MNOSHA) program to reward its worksites where managers and employees work together to develop safety and health management system.

In both examples, sustainability is implemented throughout the whole managerial and manufacturing processes. Sustainable products were manufactured in sustainable plants to generate a sustainable company image among consumers while achieving cost effectiveness in the long run.

c. Packaging/Distribution Stage

“Packaging plays a key role in brand perception, product trial and repeat purchase,” said Pete Durette, senior vice president from MeadWestvaco Corporation (MWV), a provider of packaging and packaging solutions. Every year, MWV would launch its annual report called Packaging Matters™ that studies the impact of packaging on product satisfaction and consumer purchasing behavior. In the Packaging Matters™ report 2014 [61], the attitudes of consumers in five markets (Brazil, China, Germany, France and U.S.) were investigated with 5,075 consumers participating in the study. The data shows that packaging continues to hold significant importance for consumer satisfaction, with a strong link to purchase intent and brand loyalty. However, the high environmental impact of packaging has aroused more concerns from consumers. For example, plastic packaging does not biodegrade in landfills, and cosmetic packaging has been linked to death of marine life. Those concerns stimulate cosmetic companies seeking for more sustainable packaging.

In general, most of the cosmetic products contain primary and secondary packaging. Primary packaging is in direct contact with the product. Secondary packaging is a

container that holds the primary packaging [30]. No matter how innovative the cosmetic product packaging can be, the first role it plays is to protect the product. Because of the nature of natural and organic ingredients in the products, sustainable cosmetics are more vulnerable in general, thus setting more limitations to the materials of primary packaging. The basic need for primary packaging is to be compatible with product formula, not causing additional reactions or releasing undesirable chemicals under common situations. Only with the protection of the product guaranteed, will sustainability for packaging be meaningful.

The traditional three “Rs”—“reduce”, “reuse”, “recycle”, are usually used to address the packaging impact of cosmetic products. However, the revised three Rs are more practical for sustainable cosmetic products, and they are “responsibly sourced”, “renewable” and “recoverable”. They project a concept to be more responsible for both human beings and the environment.

There are two There are two general approaches to address sustainable packaging: materials and the design approach [30]. Common materials used for cosmetic packaging are shown in the Table 2 with their general applications and properties. As the cosmetic companies are becoming more innovative in sustainable packaging for raw material selecting, new materials such as biopolymers and plant-based plastics start to be used in cosmetic packaging. One of the frontrunner in doing so is NatureWorks that uses

polylactic acid made from corn to make the packaging fully biodegradable and compostable.

Table 2 Common materials used for cosmetic product packaging

Materials	Application	Properties
Plastic/polymeric materials	Polyethylene Plastic (PE), used for Bottles, jars, tubes	Moisture resistance Low cost Recycled
	Polypropylene Plastic (PP), used for airless bottles, bottles, jars.	BPA-free Reusable
Glass	Jars and bottles for cream, toners, essential oils, high-end serum	Chemical interactions resistance Recyclable Recoverable
Metal-Aluminum	Airless bottles, bottles, jars, cap	Durable Lightweight Recyclable
Paper/paperboard	Secondary packaging	Lightweight Recyclable Reusable
Wood/Bamboo	Secondary packaging, jars Product cap	Biodegradable Toxin-free Recyclable
Hybrid constructs	Plastics + <u>paper</u> Plastics + metals Grass + Plastics	Make the most efficient use of each materials

Beside innovations in packaging materials, creative packaging design can contribute greatly to sustainability. Packaging design should first balance between the type and the amount of material used versus the protection of product. The design should also be

reasonable and appealing enough to simulate more customers' buying intention. A good example is the “360°dispensers” by Airopack. As shown in Figure 10 the dispensers are driven only by clean fresh air, yet powerful enough to dispense the contents to the last drop, even when it is sprayed upside down. On May 22, 2014, Airopack wins Luxe Pack NY in Green Award for the most innovative environmentally friendly packaging solution[62]. Sustainable cosmetic companies can either develop creative packaging themselves or collaborate with the outer sources for both sustainability and attractiveness purposes.



Figure 10 Airopack’ “360°dispensers” design that won Luxe Pack NY in Green Award, 2014[62]

Another example is Lush’s “Get Naked” packaging philosophy, which best practiced the benefit of “The most sustainable packaging is no packaging”. While other brands were convinced that packaging was an important marketing tool, Lush sold 65% of its products without any packaging. Figure 11 shows some shampoo bars from Lush without any packaging.



Figure 11 Lush shampoo bars at the retailer[63]

Packaging is an extension of a company's brand and plays major role when products are purchased, given that it is the first thing that public sees before making the final purchasing decision. Optimal package allows priority focusing on environmental performance without sacrificing quality or attractiveness. By presenting the products with a cutting-edge and environmentally friendly package, companies provide customers an image that they are trendy, innovative and responsible.

d. Product Use Stage

Sustainability for in-use practice usually includes low-fume, low energy cost, and being durable. Cosmetic customers care more about the effects and problems that may cause to the body or environment when using the product. As has mentioned in section 4.1.3.2, there is growing evidence showing that certain chemicals may cause long-term health problems. Sustainability for cosmetic companies should at first guarantee eliminating or at least minimizing the use of hazardous ingredients. Furthermore, avoid ingredients that

would be contamination to the environment although safe to human body. For example, microbeads made of the same plastics used in pop bottles and garage bags are usually added to the soaps, toothpaste or facial scrub as exfoliants or for decoration. However, after washing them away, the microbeads are draining into wastewater treatment facilities. Due to their small size, many of these plastics cannot be filtered out completely during treatment and end up in water, causing water contamination while rarely being noticed. To arouse consumers' awareness and avoid using microbeads, an environmental organization, Clean Water Action, whose mission is to protect environment, health, economic well-being, and community quality of life, launched one of its campaigns "Moving away from microbeads". Sustainable cosmetic companies can collaborate with Clean Water Action to support such campaign as a way to let their customers know the damage of using microbeads to the environment and their efforts in being responsible for the environment.

e. End-of-Life Stage

As the last stage of LCA, the end-of-life stage for cosmetic products focuses on the packaging again. The dispose of after-use packaging becomes another attractive aspect for cosmetic companies to increase their sustainable image. Besides the three "Rs" commitment for packaging, cosmetic companies can take certain practices to maximize packaging efficient-use. For example, M.A.C accepts returns of its primary packaging through the "Back to M.A.C" program. By returning six M.A.C primary packaging containers to a M.A.C counter or other collecting points, customers can receive a free

lipstick of their own choice. Moreover, an increasing number of cosmetic companies such as Tarte, Shu uemura, and DHC, are starting a refilling policy. These companies provide different design of eye shadow cases for customers to choose to refill or add any eye shadows in a chosen case.

Another strategy for sustainable end-of-life packaging is to extend product life, which means to give the product or packaging a second life for multi-purpose use. One interesting example is from Naruko, a new set-up cosmetic company from Taiwan, that currently have two official boutique locations in U.S. Naruko makes its secondary packaging a unique five-fold box, with different designs in line with the collection's concept both inside and out. Consumers can reuse the beautiful boxes, converting them into pen holders, pencil cases, and name card holders according to the instructions. Such interesting concept of reusing the cosmetic packaging made Naruko a winner in 2014 International Package Design Awards (IPDA). Figure 12 shows the Naruko Magnolia EX collection packaging and its converting model.



Figure 12 Naruko Magnolia EX collection packaging and its converting model

In summary, sustainable cosmetic companies should carefully evaluate strategies to integrate sustainability into each stage of the life cycle of their products to project a sustainable company identity to their customers.

4.2.3.3 Corporate Social Responsibility

The third component of company identity, corporate social responsibility (CSR) is about companies taking responsibility for the impact of their activities on the environment, consumers, employees, social communities, stakeholders, and other members of the public. Furthermore, companies should proactively promote public interests by encouraging community growth and development, and voluntarily eliminating practices that harm the public, regardless of legality [30]. Consumers today increasingly expect companies to embrace CSR, and CSR is relevant to consider in relation to corporate identity and corporate communication [64]. Because of this, it is becoming increasingly common for large companies to regularly publish CSR or sustainability related report. All cosmetic companies in the Global Fortune 500, including Procter & Gamble, Unilever, Johnson & Johnson, Henkel and L'Oreal, published CSR reports in 2012. In these CSR reports, all the companies' sustainable behavior are summarized. Sharing them with customers can help improve the company's sustainable image and gain customers' trust.

4.2.4 Corporate Communication

As the model shows in Figure 8, company identity should be conveyed through corporate communication in order to develop and maintain a sustainable view of the company. Corporate communication is the aggregate of messages through a variety of media, by

which the company communicates its identity to its multiple stakeholders [52]. It has been pointed out that everything a company says, makes, or does will, in some way, “communicate” to the public, especially the customers [54]. Due to the key role corporate communication plays in company management, a number of large companies set up a certain department to manage both internal and external communications. Customers are influenced in many different ways by the methods and channels of company communication. A business must be able to communicate successfully to the target market in order to create company image as well as the added value to the brand, that’s what gives the consumers the reason to buy it [30].

Some specific aspects on how sustainable cosmetic companies can focus on to create an effective corporate communication are discussed in details below.

4.2.4.1 Nomenclature and Logo

Company name and logo are the chief visual components of a company’s overall identity and condense the company’s core value. For cosmetic companies, a sustainable brand name and logo design can add greatly to the product’s success by enhancing its brand recognition. For example, the green logo from Origins, as shown in Figure 13 portrays an environmental-friendly image and the philosophy of “Powered by Nature, Proven by Science.” Such logo embeds the customers with a deep impression that Origins cosmetics are natural, green and powerful.



Figure 13 Logo from Origins

A well-chosen name and logo reflect a company's sustainable attributes and remind the customers of the value they offer, and thus help the sustainable cosmetic company stand out among the competition. A desirable name and logo for a company should appropriately communicate its sustainable identity, suggest the products' benefits and be distinctive but not complex.

4.2.4.2 Architecture

Architecture is another component in the company communication. Architecture in the digital era does not only mean concrete buildings, but official websites of the companies, and any other web pages they build in multiple media. As evinced in section 4.2.3.2, more cosmetic companies choose to integrate the manufacturing process and embody sustainable philosophy into their manufacturing plants. In addition, browsing a companies' official websites is an easy way for customers to learn about a company and its products. Therefore, building an impressive official website has been considered as one of the most important ways for companies to convey their identity, and for customer to know about the sustainability efforts made by the company.

On the website, graphic design is concerned with the overall visual presentation of an organization. It involves coordinating the style of the typeface, photography, illustrations, layout and coloring in all the company's graphics [54]. By clicking on "About us" or "Our Story" on a company's website, customers get general ideas of the company's mission, philosophy, ingredients, social responsible activities, sustainable behavior, etc. Sustainable cosmetic companies can also share their current campaign and partnering charity on the home page, so customers can catch their sustainable information at the first glance when they surf the website.

4.2.4.3 Media Relations

Media relations have become an even more crucial component of company communication strategy due to the Internet explosion. Besides the official website, companies build their communication platforms on a variety of social media, such as Facebook, Twitter, LinkedIn, Google+, etc., through which they delivery latest news, tips for using their products, as well as their efforts in supporting sustainability. By connecting with the other environmental groups or charities through such platforms, more credibility and sustainable messages can get across to the customers which in turn help to improve company sustainable identity.

A variety of media relations improve the effective feedback between customers and companies. Customers get product review and feedback not only from the mainstream media such as beauty magazines, but also from the other customers who have already

used such product. In some companies' reviewing system, customers share the experience and comment on using the product, which are accessible to all viewers. Mutual communication is enabled to let potential customers get answer to specific questions from other users. Nowadays, another important role is played by the beauty bloggers that connects or disconnects cosmetic companies with customers. These beauty experts influence many customers' purchasing intention by writing or filming their make-up hints, tips and reviews to their thousands and millions of followers at home. Since they are not sponsored by the cosmetic companies like some celebrities, people trust more on their comments and recommendations. Building up relationships with these "lead customers" and convey the sustainable message to them can better help get across the company's sustainability image to more customers.

Living in the Internet age, cosmetic companies should carefully maintain their media relations and make full use of it to convey their sustainable company image to their core customers.

4.2.4.4 Routine Interactions

Routine interactions are the direct communications between customers and a company's employees. Such interactions can be through face-to-face communications at the sale point, or through online chat or by phone conversations. How the employees portray the products and how they answer customers' inquiries directly influence the customers'

attitude towards the products and the company. Consequently, employees should be well trained on their communicating skills and be motivated to project a positive and sustainable image of the company. Nowadays, a lot of cosmetic companies have e-mails sent to their subscribed customers on a regular basis to either promote their products or inform sales and promotions ongoing. Sustainable cosmetic companies can utilize this regular communication with their customers to deliver more valuable information, such as educating them with safe ingredients knowledge, changes in the cosmetic product regulation, and the company's new activities in supporting sustainability.

Only with the company identity well defined and corporate communication effectively implemented, can a company create successful company image in the market.

4.2.5 Summery

The operational model discussed in this research envisages sustainable cosmetic companies that company image building as vital strategic resources. Top executives needs to reframe their company identities from the managerial practices to the product development and calls for more innovations in the methods and channels of company communication. A strong sustainable image has a positive impact on investor support, community goodwill, employee morale, and relationships with suppliers and consumers, which brings those companies tremendous benefits in the competitive business climate. In the cosmetic industry, it is vital that leaders recognize the importance of creating and maintaining a strong image, for only with a beautiful and sustainable image of the

company itself, can its customers believe the products bring them beauty and sustainability. By reshaping their company identity from managerial operations to product development, sustainable innovation can be implemented and realized.

Fourteen factors were identified through the research as crucial in company image building. They are summarized and organized below based on the sections discussed in this chapter.

Company identity/ product development:

1. Raw materials are sourced in an environmentally friendly way.
2. Raw materials are acquired at fair trade prices.
3. The formulation and ingredients of the product are safe and non-toxic.
4. Product manufacturing processes are environmentally friendly.
5. Packaging materials are degradable and recyclable.
6. Packaging is designed in a creative way that reduces the packaging material consumption and/or increases its repeatable use.

Company identity/ corporate social responsibility (CSR):

7. The company's corporate social responsibility (CSR) is well presented.

Company communication

8. The company logo and name are environmentally friendly perceived.
9. The company website clearly communicates its sustainable efforts.
10. The company actively collaborates with environmental groups or charity organizations to help resolve social and environmental issues.

11. Product is certified by a third-party.
12. Company receives positive feedbacks and has good reputation in social medias such as Facebook and Twitter.
13. Beauty bloggers highly recommend of the product or company.
14. Company employees show appropriate behaviors and provide effective communications.

To study the credibility of these fourteen factors identified from company image building in this section, a survey and statistical analysis were performed in chapter 5.

4.3 Strategic Alliance

The cosmetic market is occupied by giant corporations worldwide: P&G, L'Oreal, Unilever and Estee Lauder in the North America and Europe; Shiseido and Kao in Asia. Strategic alliance is considered to be an entering strategy for small and start-up companies to gain entry and penetrate the market. However, those large cosmetic companies also form alliances to combine and develop certain values with external partners to create competitive advantages. Even fierce competitors are working together at unprecedented levels to achieve their strategic goals. For example, Federal Express has drop-off boxes at U.S. Postal Service facilities [65]. Apple and IBM announced an exclusive partnership on July 15, 2014, which teams with the market-leading strengths of each company to transform enterprise mobility through a new class of business

applications. Through strategic alliances, both large and small cosmetic companies can benefit from improving competitive positioning, supplementing critical skills, responding to customers demand faster and sharing the risk or cost of major development projects[66].

4.3.1 Strategic Alliance in General

According to Jordan Lewis, a strategic alliance is a formal and mutually agreed commercial collaboration between companies [67]. Unlike joint venture, merger and acquisition, strategic alliances usually require less capital [68] and each partner maintains its autonomy while gaining new opportunities [69]. Such alliances do not form a new entity, but collaborate to some extent while remaining apart and distinct. The partners in a strategic alliance pool exchange or integrate specific business resources for mutual gain. Yet the partners remain as separate businesses [67]. A strategic alliance can help a party to meet its needs or objectives when it is not able to do so by itself efficiently [68]. Engaging in strategic alliance could also be referred to as participating in a symbiotic marketing relationship, interpreted as an alliance of resources or programs between two or more independent organizations designed to increase the marketing potential of its members [70]. When it comes to high-tech scope, such an alliance would be more like a research partnership, formed to pursue specific new technology development jointly. Although there are many narrow definitions of what constitutes a strategic alliance based on each different viewing angle, a broad definition should be more recapitulative that

suits most situations. Broadly defined, a strategic alliance is a formal relationship created with the purpose of joint pursuit of mutual goals, where partners bring together particular skills, information and resources, share administrative authority and social links [65, 71]. While strictly speaking, strategic alliances should be tactical activities, they assist members to achieve strategy objectives. For this reason, some practitioners classify all alliances designed to achieve strategic goals as strategic alliance, regardless of whether they are in a short or long term relationship [65].

Strategic alliances occur between companies, competitors, governments, universities or some non-profit organizations. Such partnership blurs companies' boundaries and can be national crossing. Strategic alliance now is considered as an essential business strategy to help companies increase their business performance and strengthen their market share, not only because such alliances enable companies to move ahead faster and work more efficiently. Additionally, it may be noted that strategic alliance can, in some cases, be the only practical way to gather a variety of specialists needed for operating in today's complex and fast-changing environment [65]. In a rapidly evolving world full of uncertainties, and of all the trends consciously or unconsciously influencing business strategy, few will have more of an impact on companies than strategic alliance [72].

Briefly summarized, a company's forming of a strategic alliance helps each participant to gain powerful benefits serving a variety of crucial business needs. The most notable benefits are summarized below in order of their importance.[68, 69, 72, 73]

1. **Marketing.** Strategic alliances help companies to enter new markets by enabling them to share established distribution systems and increase distribution networks without incurring great cost and delay in market penetration. It also helps companies to enter new international markets by overcoming political, economic, and social barriers.
2. **Opportunity.** Strategic alliances provide opportunities for start-up companies to gain access to intangible assets like brand name, expertise, marketing experience and quick distribution channels. It is considered an effective way for start-ups to learn from mature companies' capabilities to make progress and speed up market entry in the short term.
3. **Innovation.** A Single company may only possess parts of the necessary resources and capabilities and lack several others. Strategic alliance makes it possible to bring together cross-disciplinary specialists from all participating organizations. They learn from each other's knowledge, technology, skills and experience as they work together. It helps increase the likelihood of successful innovation activities and shorten innovation cycles.
4. **Cost.** Strategic alliances can help decrease the manufacturing costs, and realize a reduction of capital costs from project, production, or services by sharing them among the alliance partners.
5. **Resources.** Strategic alliances can provide partners the opportunity to widely share resources and information including raw materials, labor, key components, even the patent contents.

6. **Manufacturing.** Strategic alliances can help to improve manufacturing performance and productive capacity to broaden product line, services and processes, and to fill product line gaps in current products.
7. **Risk.** Risk sharing in strategic alliance can help dilute risk impact in future competition, especially financial risk that is involved in purchasing new products, services or technologies when a single company cannot afford for them. Such alliance can also help to decrease internal and external uncertainties in environment.

4.3.2 Establishing Strategic Alliance in Sustainable Cosmetic Industry

Sustainable innovation for cosmetic companies aimed at inspiring new concepts, technologies and distinctive marketing strategies is a solution to protect the ecosystem and mitigate the negative impact on the social and natural systems. Sustainable innovation in the cosmetic industry is also a solution to protect human beings, by decreasing the ingredients content of harmful chemicals to contribute to their long-lasting health. A trend of shifting from the traditional synthetic cosmetics to sustainable cosmetics has been seen in the recent past years, when more and more existing giants as well as start-ups in the cosmetic industry put forward natural and organic cosmetics.

Building strategic alliance can help a company better manage its sustainable innovation by enforcing the regulation and establishing its own design as the dominant design. A big issue faced by the sustainable companies worldwide is the lack of a supportive policy with clear definition. Western Europe is a pioneer in promoting a green cosmetic world. In February 2002, six European cosmetic certification agencies as the representative of

different countries (Bioforum Belgium, the Soil Association, Ecocert Greenlife, CosmeBio, BDIH and ICEA) initially formed the COSMOS group to harmonize natural and organic cosmetic standards in Europe. Forming into one alliance group helps to reduce confusions caused by different standards for consumers and benefits both consumers and manufacturers.

However, current situation in U.S. is quite different. Victor Morrison, CEO of Dr. Hauschka Skin Care stated that “The challenge for brands that were founded and built on the natural and organic philosophy is that there is no current standard for what constitutes natural in U.S.”, he also indicated that because of such shortage of standards, it falls to each brand to educate their customers on the uniqueness of their offer. Unlike the food industry in U.S., where the “USDA ORGANIC” label has been widely accepted and notable for consumers to help them identify authentic organic food, the regulation for natural and organic cosmetics appears to be quite immature and rarely noticed by cosmetic consumers.

An increasing number of cosmetic companies especially small and medium-sized enterprises (SMEs) are seeking for specific standards to differentiate their products in the marketplace. Due to the lack of the standards and regulations specifically for green cosmetic products in U.S., those companies have to borrow the standards from the food industry through its National Organic Program. As a result, even though there are three main standards in the U.S. natural and organic market, NPA/USDA/NFS, not much

attention has been aroused among the cosmetic producers and customers. Building strategic alliance among the organizations that closely follow the green movement to form a potent coalition will be an effective way to enforce and boost the regulation in the sustainable cosmetic industry.

To build sustainable alliance, companies should collaborate with government and environmental groups to create and promote legislated environment with clear standards for organic and natural cosmetics. Furthermore, they can accelerate the market by building a sustainable corporate image and implementing customer education.

Establish Dominant Design

With the current situation in the sustainable cosmetic market ruled by various relevant regulations, strategic alliance formed with governments, non-profit organizations, environmental groups or other cosmetic companies can help develop and push sustainable cosmetic standards as well as making a great impact on the dominant design in the market. A dominant design in a product class is defined as “the one that wins the allegiance of the market place, the one that competitors and innovators must adhere to if they hope to command significant market following [74]”. Industry regulation has great power to impose the standard, and thus defines the dominant design [74]. When supported by global demand or regulatory trends, strict regulation results in the creation of lead markets [75].

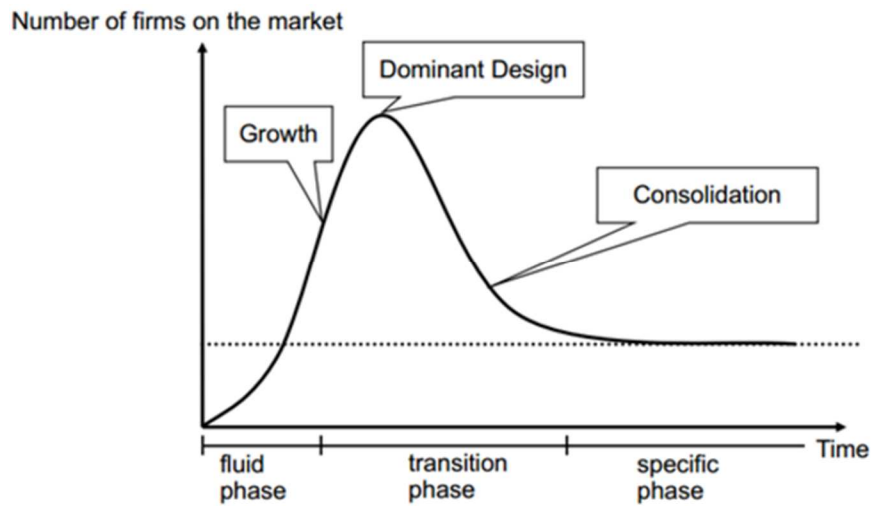


Figure 14 Abernathy-Utterback-Model for the emergence of dominant design

Abernathy-Utterback-Model portrays what happened when a new technology develops into new standard, shown in Figure 14. This model can be also used to explain the emergence of the dominant design for sustainable cosmetic standard. In current U.S. cosmetic industry, the larger number of the companies stands in the fluid phase, when companies make choices in various standards or even claim on their own for natural and organic cosmetic products. The market is tested using many different approaches based on customers' needs and preference. However, with an increasing customers' awareness of natural and organic cosmetic standards to help them find trustable products, and with more cosmetic companies' urgent demands on a normative and wide accepted standards to follow up, a dominant design will emerge towards the end of this phase.

In fact, many agencies and organization are working hard to put forward their own natural or organic cosmetic standards in the market. Besides the three major standards -

USDA/NOP, NSF ANSI 305 and NPA discussed in section 3.2. In 2010, draft guidelines for natural and organic cosmetic products were tabled by the International Standardization Organization (ISO), which consist of two parts: Definitions (16128-1) and Criteria (16128-2), and the draft is likely due in 2016. However, cosmetic companies are voluntary to choose whether to use the standards and customers do not have adequate knowledge on those standards. The challenges are similar to the acceptance of new technology in the market; green cosmetic standards need to be adopted by major companies and large number of customers in order to win the market. As defined and discussed in section 4.1 and 4.2, standards for sustainable cosmetics should not only include safe ingredients, but also include the regulation on ethical sourcing, manufacturing processes, and packaging, etc. Unlike the dominant design induced by technological innovation that can possibly be accomplished in one organization, the dominant design of standardization can be hardly achieved by a single company. Strategic alliance from multi-party would gain more power to promote this regulation activity and help the company win the battle.

4.3.3 Forming Strategic Alliance for Sustainable Cosmetic Companies

Strategic alliance for sustainable cosmetic companies can be realized with multiple parties for different purposes. This section illustrated some key alliance with different parties identified typical in this research.

a. Green Alliance with the Environmental Groups

For sustainable cosmetic companies, establishing a “Green Alliance” is an important strategy to help them win the market. Green alliance is referred to as a partnership between businesses and environmental groups to help companies make environmental marketing activities. It can be an effective strategy for integrating corporate environmental responsibilities with market goals [70, 76]. Hartman viewed green alliance as the outcome of an emerging paradigm called “market-based environmentalism”(MBE). Rather than coercing companies to deal with the environment through government mandates, MBE’s objective is to create market incentives that “make ecology strategically attractive to businesses [76]”. Partnering with environmental groups is a practical business strategy because of companies’ insufficient expertise and public trust to deal with environmental problems. Different from other more traditional strategic alliance, forming a green alliance with environmental groups can provide companies with extra benefits to marketers of consumer goods, summarized as:

- 1) Increase consumer reliability in green products and their claims [70]
- 2) Help company build green image while reducing public criticism
- 3) Equip company with adequate environmental information
- 4) Access to new markets
- 5) Educate customers about key environmental issues relating to the firm and products

Three typical green alliances between companies and environmental groups have been discussed in terms of the format, marketing goals and the credibility received by the company [70]. They are summarized in Table 3.

Table 3 Three types of green alliance

Types of alliance	Format	Marketing goals	Credibility
Product licensing	Environmental groups allow a company to use its name to brand the company's product.	Increase the sales. Build differentiated product.	Low
Corporate sponsorship	Companies directly contribute to the environment groups by being involved in specific environmental causes or funding relevant activities.	Associate company with environmental cause. Build socially responsible corporate image.	Medium
Product endorsement	Environmental groups endorse a product after it has met some a set of certain established criteria.	Differentiate the products in marketplace. Support green claims to make it credible.	High

Allying with environmentalists help the companies gain public credibility and obtain expertise in developing sustainable products and realizing sustainable operation. Establishing green alliances can help a company make its green marketing claims more credible to customers and reach more potential customers who care about being “green”. Environmental groups in turn acted as the third-party to educate the customers with important issues relating with the cosmetic company and products.

As mentioned in Table 3, among the three main types of green alliance, “Corporate sponsorship” and “product endorsement” are commonly used in green cosmetic industry.

Table 4 displays the corresponding examples among cosmetic companies.

Table 4 Types and examples of green alliance in cosmetic industry

Types of Alliance	Examples	
Corporate sponsorship		In 2002, The Body Shop partnered with Greenpeace to campaign for renewable energy. Over six million people signed the petition, which was delivered to the World Summit for Sustainable Development in Johannesburg.
		LUSH launched the “Charity Pot” program in 2007. They partnered with over 600 grassroots charities including environmental, animal welfare, and humanitarian groups in 35 countries, and has donated more than \$5,800,000.
		Origins launched the “Origins Plant-A-Tree” initiatives program to aid reforestation projects globally in partnership with the American Forests’ Global ReLeaf and other local organizations.
Product endorsement		Juice Beauty’ products are certified by USDA, California Organic Product Act, NSF, Leaping Bunny Cruelty Free Certification, and PETA Cruelty-Free Certification.
		The Earth Mama Angel Baby’ products are certified by USDA, NSF, American Herbal Products Association, Organic Consumers Association, Gold Green American, Non-GMO Project.
		Besides their products, the cosmetic company itself can get certified. Aveda is certified by MNSTAR, the Minnesota Occupational safety and Health Administration program, to recognize worksites where managers and employees work together to develop safety and health management systems.

In those examples, cosmetic companies build alliance with the various environmental groups in different levels, which helps them develop the green marketing in an effective manner, and allow them to overcome three problems associated with green marketing: poor credibility, consumer cynicism; and consumer confusion [70].

b. Alliance with the Supplier

As discussed in section 4.2, cosmetic companies are collaborating with qualified suppliers to ensure their sourcing raw materials in a sustainable manner. Carefully choosing the suppliers with the same perception of sustainability as their partners is the first important step. “Ethical buying” is not only for individuals, but also for companies that are trying to attract sustainable customers. When companies select suppliers for raw materials. They are encouraged to seek out the suppliers with similar dedication to sustainability, and to develop collaborations with them in order to improve the behavior of ethical sourcing. Examples can be found in both giant and small cosmetic companies. In February 2014, L’Oreal collaborated with Evolva, which is an ingredient supplier whose mission is to discover and provide innovative, sustainable ingredients for health, nutrition and wellness to apply L’Oreal’s innovative fermentation technology to develop a yeast strain optimized for sustainable and cost-effective production of a strategically important cosmetics ingredient. Babyganics as a new hit to the natural baby products markets is teaming up with Botanic Innovations, a natural cold-pressed seed oil supplier to develop their new ingredient called NeoNourish®, which is blended with 100%

natural, cold-pressed seed oil specifically for the unique needs of babies' work-in-process skin.

Developing alliance with qualified sustainable suppliers is an important business strategy for cosmetic companies to realize sustainability in the first step. It is also a way to help them build sustainable company image.

c. Alliance with Competitors

The cosmetic company has seen competitors building strategic alliance for reasons and benefits discussed earlier. Partners in these cases explore new markets or share markets internationally. For example, in November 2000, L'Oreal Group announced strategic alliance with Shu Uemura Cosmetics Inc., aiming to help Shu Uemura reinforce its position in Japanese cosmetic market and gain access to North American market on one hand. In 2014, Avon Products, Inc. entered into a strategic alliance with a Greek skin care brand "Korres", through which Korres granted Avon exclusive rights to develop, manufacture and market Korres products in Latin America, which is one of the global regions that has the highest growth in cosmetic sales.

For small cosmetic companies that try to enter into the cosmetic market with sustainable products, building strategic alliances with competitors is a fast way to penetrate the market. Start-ups or small sized companies may collaborate together to work on the promotion of the sustainable cosmetic standards, and to differentiate their products and

increase competitiveness in competing with notable large-sized companies. A start-up company featured with sustainable cosmetics can also build alliance with existing large companies; utilizing their established distribution channels and learning from their advanced managerial skills. Through such alliance, large company may also benefit from start-up as they have advantages of being agile and can quickly adapt and respond to the changes in the market. The alliance among large-sized companies may bring great impacts on the regulation and standards for the sustainable cosmetic industry because of their existing popularity among public. A dominant design may emerge through such alliance.

d. Alliance with the Retailers

Because of the rising consumers' expectations to consume in sustainable manner, retailers must take an inside-out view of their sustainability strategy. Sustainability plans that may have been created within the company, now requires the company to engage with external partners in order to successfully build and manage sustainability. In 2014, Walmart and Target together teamed up with cosmetic suppliers to improve sustainability performance. They organized "Beauty and Personal Care Products Sustainability Summit" with the hope to start a conversation about a shared approach to product sustainability. For start-up sustainable cosmetic companies, partnering with retailers would be an effective gateway to help them penetrate the market. The young natural cosmetic brand Yes To TM set up in 2006 is the one to seize such opportunity. After three months and the development of 16 carrot contained cosmetic product platform, they got

the opportunity to sell them in the US drugstore chain Walgreens. The collaboration between Yes To TM and Walgreens soon created a win-win scenario in a short period of time. Through the alliance, Yes To TM hit the natural beauty market with a unique brand voice. Walgreens also successfully added another natural cosmetic brand category in their drugstores after the success of introducing BURT'S BEES earlier.

Sustainable cosmetic companies can work closely and establish effective strategic alliance with retailers, department stores, drugstores and special chains of cosmetic store, such as Sephora and ULTA in the US, to achieve a clear product positioning and win the market. Alliance with the prestigious online cosmetic store such as Dermstore, and Skinstore can also help sustainable cosmetic companies occupy cosmetic market. Furthermore, alliance with the retailer stores for sustainable cosmetic companies dose not only mean selling the cosmetic products at these stores, sustainable cosmetic companies can develop in-depth alliance with the retailers to advance sustainability by customer education.

e. Alliance with Other Organizations

Strategic alliance can be formed with a various type of organizations, with the same purpose to help sustainable cosmetic companies advance sustainability and achieve competitive advantages in the market. Two examples are presented below to illustrate the alliance with multi-parties. In 2004, Environmental Working Group (EWG) launched Skin Deep, which is an electronic cosmetic database to create online safety profiles for

cosmetics and personal care products. It aims at filling in where industry and government leave off. The database contains ingredients in 60,560 products under 2,126 brands. Although Skin Deep tried to include all the cosmetic brands and products into its database, there are still a lot missing, especially those newly launched ones. Working with Skin Deep to incorporate the products information in the database will help a sustainable cosmetic company enhance its product credibility and thus strengthening the brand's market position. For example, Pure & True organic beauty, a young brand in the sustainable cosmetic industry, collaborated with Skin Deep to incorporate its organic cosmetics into the database, and it is also advertised on Pure & True official website.

Establishing strategic alliance with well equipped laboratories from universities and research agencies can help sustainable cosmetic companies source more effective and green ingredients to improve their products and manufacturing process. Technological breakthroughs in the universities and research centers can be better transferred and capitalized through such strategic collaborators.

4.3.4 Summary

This section discussed how strategic alliance impact on the sustainable innovation in the cosmetic industry by illustrating the emergence of dominant design in the sustainable cosmetic standards. Some key alliance with different parties were identified and illustrated, including alliance with environmental groups, competitors, suppliers, retailers and the alliance with other organizations.

Unlike traditional innovations, innovation for sustainability as a whole involves a paradigm-shift in the existing political and economic systems, and thus is more complex and multidimensional. A single organization is unlikely to have adequate resources and the ability to effectively innovate in this arena [17]. Effectively utilizing strategic alliance will help companies, especially the small start-ups to better manner and thrill in this field.

5. Research Method, Data collection and Results

To test the impacts of customer education on customers' decision in choosing sustainable cosmetic products and study the importance of the factors identified in company image building, a survey was conducted and a statistical analysis were performed. The complete survey is attached in the Appendix. The survey was internet-based using the online survey program Qualtrics to collect data from sample population. Distributed via email, cosmetic forums, and social networks, the survey asked for participants' experience with and opinion upon sustainable cosmetic products. Data were collected mainly from the students, faculty and staff at the University of Minnesota, Duluth (UMD) and from cosmetic forum members in the Associated Skin Care Professionals (ASCP), Cosmetics & Toiletries Magazine and etc. The UMD Women's Club helped e-mail distribute, and people who received notification from them were encouraged to forward the e-mail on to friends, colleagues and others who might be interested to participate.

5.1 Survey Design

The survey was designed to test the credibility of section 4.1 Customer education and 4.2 Company Image Building, identified as contributing factors in sustainable innovation in cosmetic companies. The survey on customer education contains two parts. In the first part, besides questions on control factors such as the respondents' gender and age (Q1 and Q2), a series of nine questions (Q3 to Q11) were asked to get the respondents' experience with and opinions upon sustainable cosmetic products. In the second part, the same nine questions were repeated after related information with an aim to educate

respondents was given. For example, in Part I, question Q10 asked about respondents' opinions on how sustainable cosmetic products that are certified by an independent third party compare to those with no certification. In Part II, after the explanation of what certification is and an example of certified organic cosmetic product was given, the same question was asked again in Q18. Table 5 lists all the questions asked in the two parts of the survey and the related discussion in the section 4.1.

Table 5 Survey questions and section discussed in the research

Survey questions	Discussed in section
Q3, Q20. How important do you think of the following four factors in terms of your purchase decision for cosmetic products? Effectiveness/Quality, Price, Brand, Being Sustainable able Options: Extremely important, Very important, Somewhat important, Neither important nor unimportant, Somewhat unimportant, Very unimportant, Not important at all.	4.1
Q4, Q21. Please rank the following four factors from 1 to 4 in order of importance to your purchase decision for cosmetic products. 1 is the most important and 4 is the least important to you. Price, Brand, Effectiveness/Quality, Being sustainable	
Q5, Q12. While choosing a cosmetic product, do you check to see its ingredients? Options: Always, Sometimes, Never	4.1.3.1
Q6, Q13, Q14 Do you avoid cosmetic products that contain hazardous ingredients? Options: Always, Sometimes, Never, I don't know what ingredients are considered hazardous.	4.1.3.2
Q7, Q15. Have you used any sustainable cosmetic products? Options: Yes, No, I am not sure	4.1.4
Q8, Q16. Are you currently using any sustainable cosmetic products? Options: Yes, No, I am not sure	
Q9, Q17. Will you purchase a cosmetic product in the next two years? Options: Yes, No, I am not sure	
Q10, Q18. In your opinion, how do sustainable cosmetic products that are certified by an independent third party compare to those with no certification? Options: Certifications made the products more trustable	4.1.3.3

Certifications made no difference Certifications made the products less trustable	
Q11, Q19. If you are considering buying a sustainable cosmetic product, will you purchase one that is not certified? Options: Yes, Maybe, No.	

For survey questions designed to study the impact of company image building, participants were asked to indicate the importance of the fourteen factors identified as crucial in the section 4.2 on the company image building to their purchase decision towards a sustainable cosmetic product. Table 6 lists all the questions asked in Part II of the survey and the related discussions in section 4.2 of Chapter 4.

Table 6 Question design and section discussed in the paper

Survey Question	Discussed in section
1. Raw materials are sourced in an environmentally friendly way.	4.2.3.2
2. Raw materials are acquired at fair trade prices.	
3. The formulation and ingredients of the product are safe and non-toxic.	
4. Product manufacturing processes are environmentally friendly.	
5. Packaging materials are degradable and recyclable.	
6. Packaging is designed in a creative way that reduces the packaging material consumption and/or increases its repeatable use.	
7. The company's corporate social responsibility (CSR) is well presented.	4.2.3.3
8. The company logo and name are environmentally friendly perceived.	4.2.4.1
9. The company website clearly communicates its sustainable efforts.	4.2.4.2
10. The company actively collaborates with environmental groups or charity organizations to help resolve social and environmental issues.	4.2.3.2
11. Product is certified by a third-party.	
12. Company receives positive feedbacks and has good reputation in social medias such as Facebook and Twitter.	4.2.4.3
13. Beauty bloggers highly recommend of the product or company.	
14. Company employees show appropriate behaviors and provide effective communications.	4.2.4.4

For all fourteen questions, the respondents were asked to choose from 1 being “not important at all” to 7 being “extremely important”.

5.2 Statistical Data Analysis

To test whether the differences between the responses before and after the customer education are statistically significant, a paired permutation test was performed on the data in pairs. Permutation test doesn't require any distribution assumption for the test data. Given that there are only 3 or 4 possible values for each response, it is not reliable to make any parametric assumptions here, which requires a certain response distribution such as Gaussian or Poisson. We use the standard level 0.05 to indicate if statistically significant difference exists. This means that if the p-value is less than 0.05 then the difference between “before” and “after” is statistically significant. The results of the survey were summarized in section 5.3.

5.3 Results and Discussion

5.3.1 General Demographics

109 persons participated in the survey, with 83 (76%) completions. The sample has a significantly higher representation of females (83.1%) as compared to males (14.5%) and with 2.4% choosing not to say. The overall sample is relatively young with majority of respondents (71.4%) between the ages of 15 and 35. The locations of the respondents were identified based on their IP address and Table 7 shows the distribution of them together with the other characteristics of the sample population.

Table 7 Characteristics of the sample population

Sample Size		83
Gender	Male	14.5%
	Female	83.1%
	Choose not to say	2.4%
Age	15-25	26.5%
	26-35	44.6%
	36-45	12%
	46-55	14.6%
	>55	2.4%

5.3.2 Attitudes towards Cosmetic Ingredients

Questions Q5 and Q12 are used to test the impact of customer education on changing customers' attitude towards product composition and formulation when purchasing a cosmetic products.

Questions Q5 stated:

Q5. While choosing a cosmetic product, do you check to see its ingredients?

After the following information about cosmetic ingredients were given,

“Do you know that there are some hazardous ingredients in the cosmetic products that are suggested to be avoided? Based on the possibility of leading to cancer, endocrine disruption, allergies/ immunotoxicity, biochemical or cellular level changes, etc., these ingredients are rated on a 0-10 scale in terms of their hazardous levels, as shown in the following Table. For example, parabens, such as methylparaben and propylparaben have been shown to be related to breast cancer.

Table. Examples of ingredients at different hazardous levels

0-2 Low hazard	3-6 Moderate hazard	7-10 High hazard
Paraffin EDTA Sulfur	Dimethicone Methylparaben Petroleum/Mineral Oil	Fragrance Propylparaben Oxybenzone

Source: EWG's Skin Deep Cosmetics Database"

question Q12 asked:

Q12. Next time when you are purchasing a cosmetic product, will you check to see its ingredients?

Figure 15 shows participants' attitudes change toward checking cosmetic ingredients in their purchase decision before and after the education.

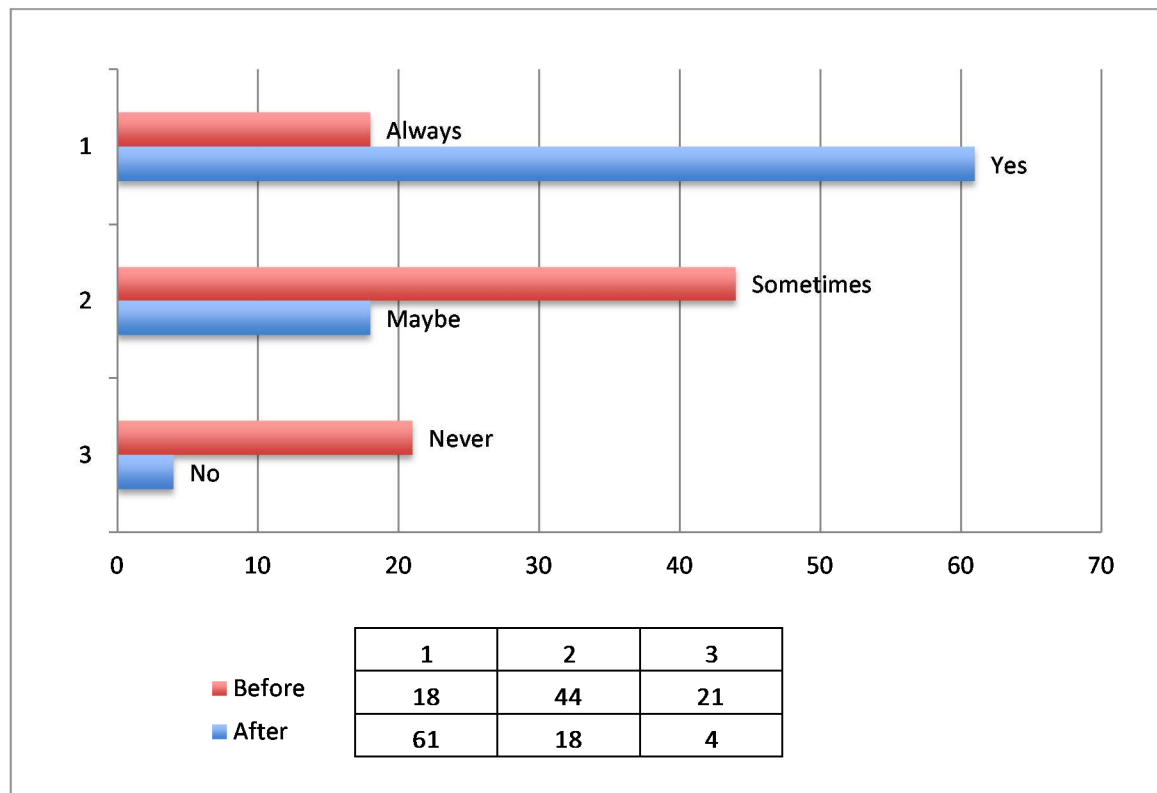


Figure 15 Participants' attitudes toward checking cosmetic ingredients before and after education

A decrease in “No” and a significant increase in “Yes” as the answers to whether ingredients would be checked in cosmetic product purchase decisions after related education is shown, as depicted in Fig 15. A p-value of $1.595e-10$ from the permutation test indicates that the difference between the customers’ choices before and after the education is statistically significant. The result of this comparison indicates that customers need to be educated to make them aware that not all the ingredients in the cosmetic products on sale are safe.

Next questions Q6 and Q14 used to test customers’ attitudes towards the cosmetic products that contain hazardous ingredients before and after proper education.

Question Q6 stated:

Q6. Do you avoid cosmetic products that contain hazardous ingredients?

After the following information about hazardous cosmetic ingredients was given:

“The use of *parabens* as the preservative in cosmetic products has arose a lot of concerns due to possible endocrine, hormonal disruption as well as breast cancer. Nowadays, more and more cosmetic brands including Origins, Burt's bee, and Bareminerals claim their products as parabens-free. But there are still considerable amount of cosmetic products such as some products from Kiehl’s, Cetaphil, Aveeno, Covergirl, L’Oreal Paris, Maybelline, Revlon, etc. containing those hazard ingredients.”

question Q14 asked:

Q14. Will you avoid cosmetic products that contain hazardous ingredients in the next two years?

Figure 16 shows that participants' attitudes change towards cosmetic products containing hazardous ingredients before and after reading the education.

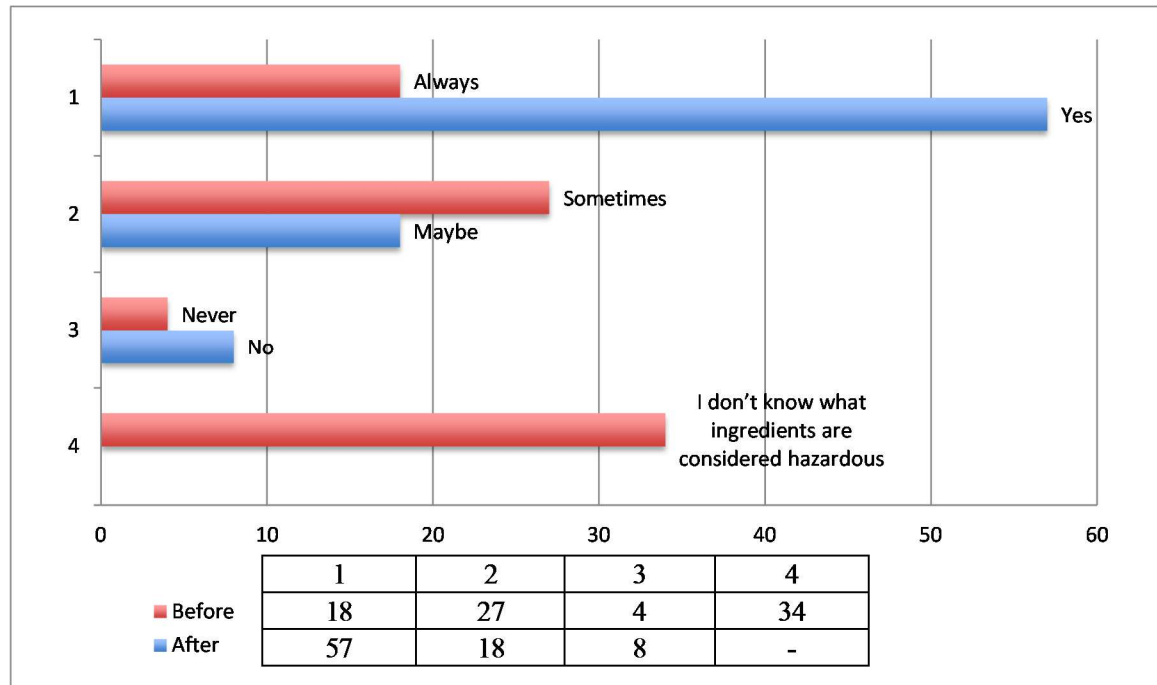


Figure 16 Participants' attitudes toward cosmetic products containing hazardous ingredients before and after the education

A p-value cannot be obtained from this comparison because a paired permutation test cannot be run based on different responding options. However, a significant shift from “I don’t know what ingredients are considered hazardous” to “Yes” after the education can be observed as depicted in Figure 16.

The result of these two pairs of comparison in section 5.3.2 indicates that sustainable cosmetic companies need to make their customers aware that not all the ingredients in the cosmetic products on sale are safe. They should also educate their customers with proper ingredients and formulation knowledge in choosing real sustainable cosmetics. This is

also a way to help sustainable cosmetic companies differentiate their products from the others' in the market.

5.3.3 Experiences with Sustainable Cosmetic Products

Question Q7, Q8 and Q9 correspond with questions Q15, Q16 and Q17 as a series of questions that tested participants' experience with sustainable cosmetic products.

Q7. Have you used any sustainable cosmetic products?

Q8. Are you currently using any sustainable cosmetic products?

Q9. Will you purchase a sustainable cosmetic product in the next two years?

After the following definition of sustainable cosmetics was given:

“A cosmetic product can be called sustainable if: 1.) it is sustainable for the users—it has no short- and long-term potential hazardous impact on the users; and 2.) it is produced from a sustainable production processes that is environmentally friendly and sources raw material, formulates, manufactures, packs, distributes, and markets the products in an ethical way.”

questions exactly the same were asked again in question Q15, Q16 and Q17. Fig 17, 18 and 19 show participants' experience with sustainable cosmetic products before and after they were educated with the definition of sustainable cosmetic products.

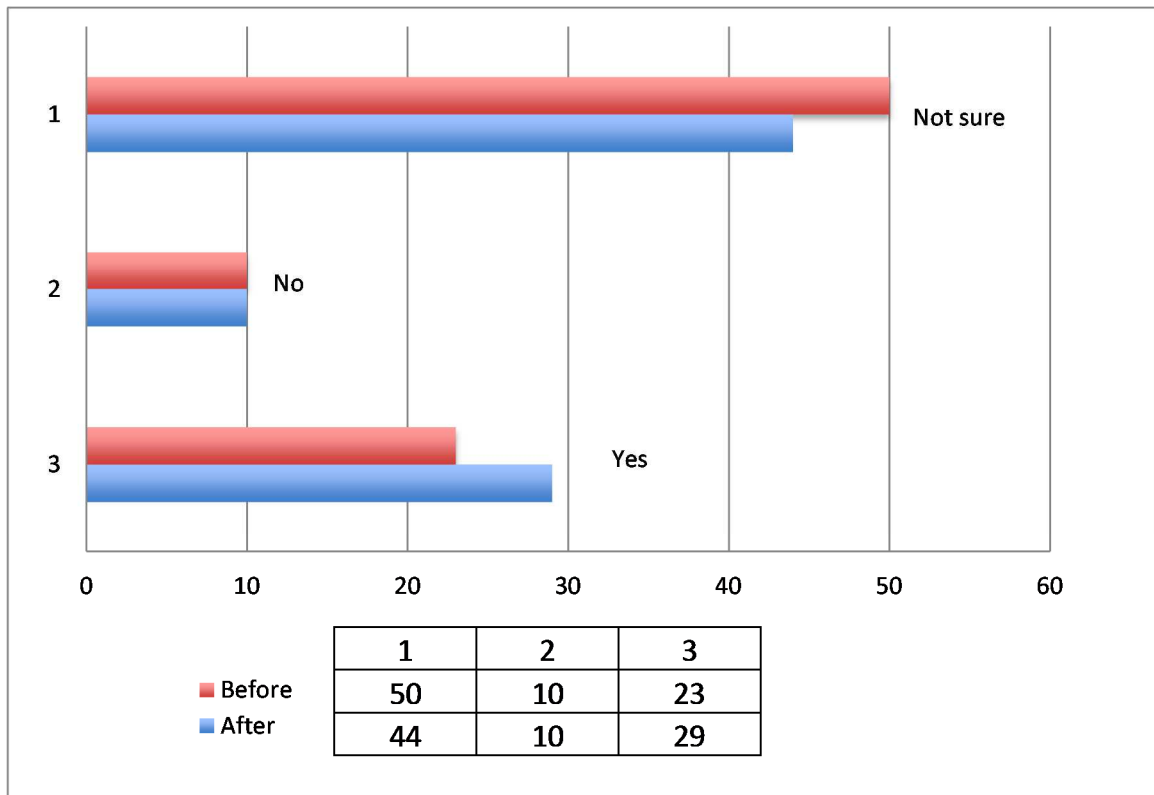


Figure 17 The comparison between Q7 and Q15 on “Have you used any sustainable cosmetic products”

No significant difference (p-value of 0.08509) is seen from the answers on “Have you used any sustainable cosmetic products” before and after the education on the definition of sustainable cosmetic products as shown in Figure 17. More than half of the respondents choose “Not sure” in both question Q7 and Q15. This maybe due to the fact that customers did not check the ingredients of the cosmetics they used before, as indicated in the answers to question Q5, so it is difficult for them to judge whether they have used any sustainable cosmetic products.

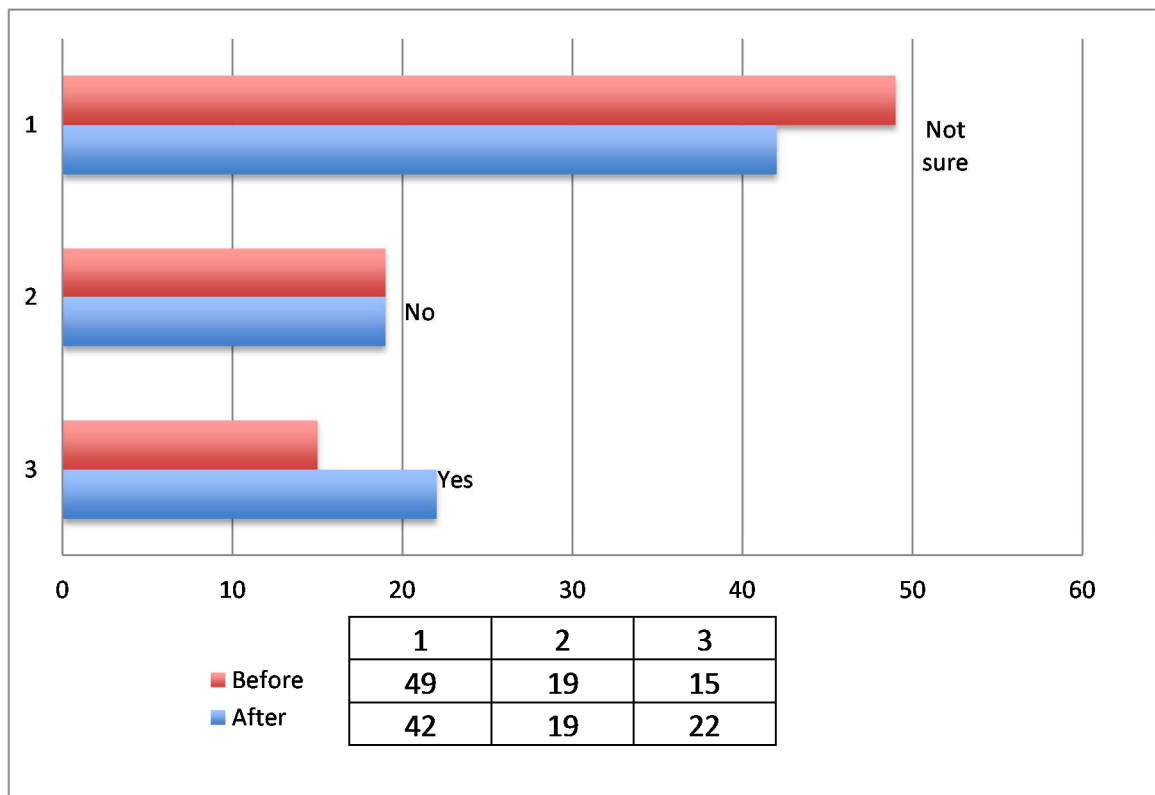


Figure 18 The comparison between Q8 and Q16 on “Are you currently using any sustainable cosmetic products”

Also, no significant difference (p-value of 0.0522) is seen from the participants’ answers to “Are you currently using any sustainable cosmetic products?” before and after the education on the definition of sustainable cosmetic products as shown in Figure 18. Only a slight increase is seen in the number of participants claiming that the cosmetic products they are currently using are sustainable after the education. Similarly to answers to questions Q7 and Q15, the majority of participants choose “ I am not sure” on whether the cosmetic products they are using are sustainable or not, both before and after the definition was given. One possible reason is that it can be difficult to identify whether the cosmetic product is produced from a sustainable production processes that is environmentally friendly and sources raw material, formulates, manufactures, packs,

distributes, and markets the products in an ethical way, which is the second condition that needs to be met in the given definition of sustainable cosmetic products.

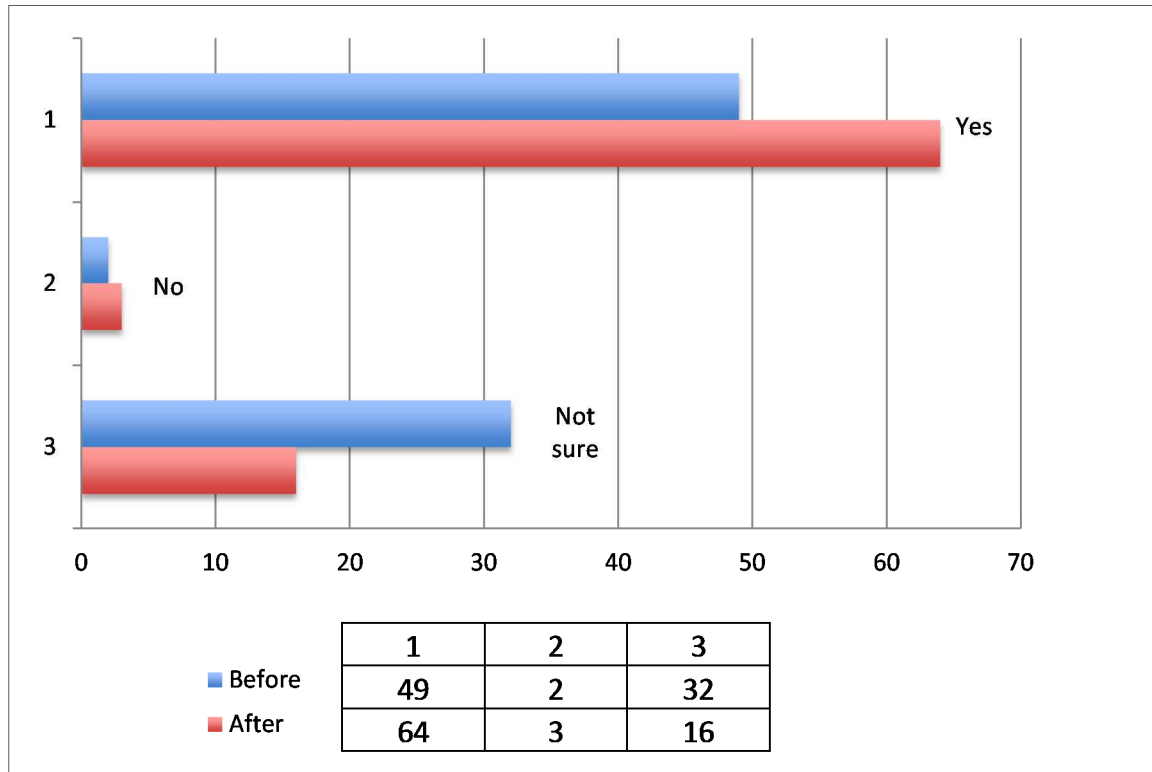


Figure 19 The comparison between Q9 and Q17 on “Will you purchase a sustainable cosmetic product in the next two years”

An increase in “Yes” as the answer to “Will you purchase a sustainable cosmetic product in the next two years?” is observed after the definition of sustainable cosmetics was given shown in Fig 19. The p-value of 0.0008888 indicates that such difference between before and after the education is statistically significant. The three pairs of comparison indicate that sustainable cosmetic companies need to educate their customers on choosing real sustainable cosmetics not only the ingredients, but also the manufacturing processed.

5.3.4 Customers' Opinions and Purchasing Behavior on Certified Natural and Organic Cosmetic Products

Questions Q10, Q11 and Q18, Q19 are two sets of questions designed to test the impact of customer education on customer's perception and purchasing behavior in a certified natural or organic cosmetic product.

Questions Q10 and Q11 state:

Q10. In your opinion, how do sustainable cosmetic products that are certified by an independent third party compare to those with no certification?

Q11. If you are considering buying a sustainable cosmetic product, will you purchase one that is not certified?

After additional interpretation and an example of cosmetic certification was given:





“Certain standards for organic and natural cosmetic products have been set up by a few third-party organizations in the U.S. such as USDA , NSF  and NPA . A third-party certification means that an independent organization has reviewed the manufacturing process of a product and has independently determined that the final product complies with specific standards for safety, quality or performance. For example, the following table shows examples and detailed explanation on the definition given by NPA for its certified products.”

Table. NPA certification of cosmetic products

Organization	Explanation	Featured Certified Products
--------------	-------------	-----------------------------

 <p>NPA (Natural Product Association)</p>	<ul style="list-style-type: none"> • Natural Ingredients: A product labeled "natural" should be made up of only, or at least almost only, natural ingredients and be manufactured with appropriate processes to maintain ingredient purity. • Safety: A product labeled "natural" should avoid any ingredient with a suspected human health risk. • Responsibility: A product labeled "natural" should use no animal testing in its development. • Sustainability: A product labeled "natural" should use biodegradable ingredients and the most environmentally sensitive packaging. 	<ul style="list-style-type: none"> • Burt's Bee • Himalaya • CARA Natural Products <p style="text-align: right;">B</p>
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Questions exactly the same were asked again in Q18 and Q19. Figure 20 and 21 show participants' perceptions on and purchasing preference in certified cosmetic products before and after the education.

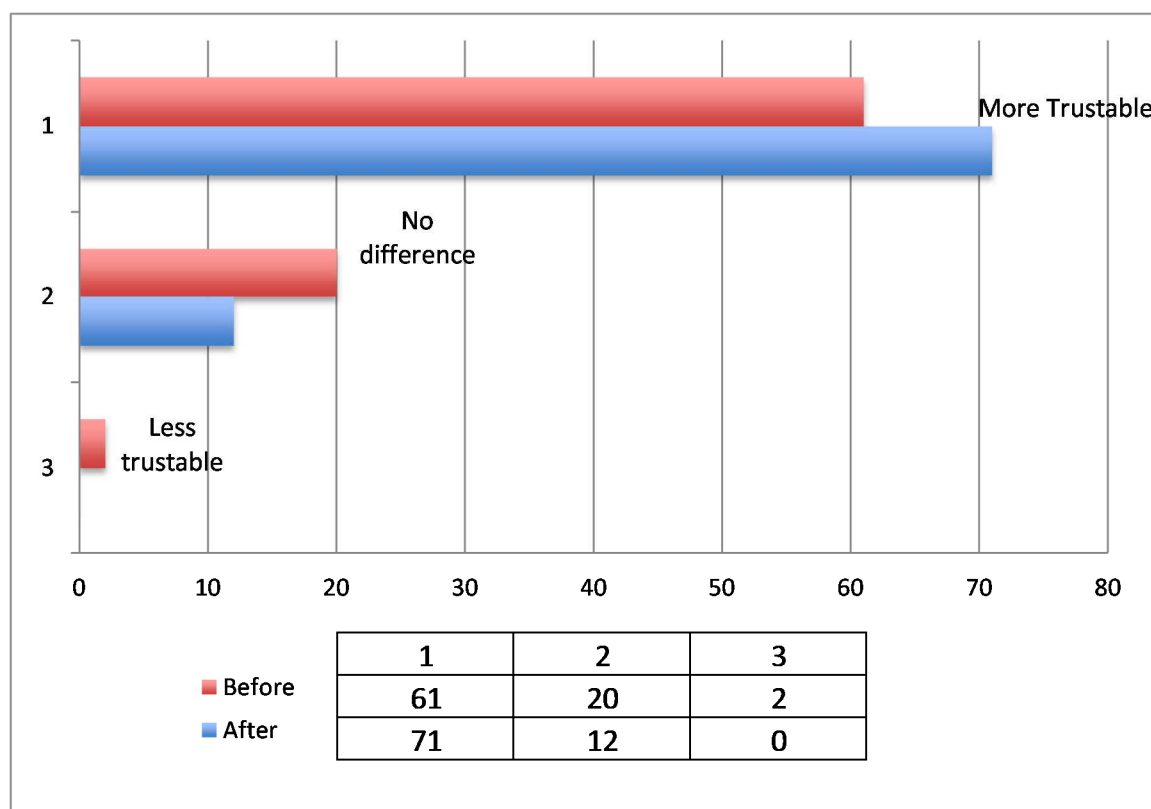


Figure 20 Participants' opinions upon cosmetic certifications before and after the additional interpretation and an example of the certification were given

An increase in choosing “certifications made the products more trustable” is seen after the education, as shown in Figure 20. Also, no one chose “certifications made the products less trustable” after the education and example of certification were provided. The p-value of 0.001341 indicates the difference between before and after education is statistically significant.

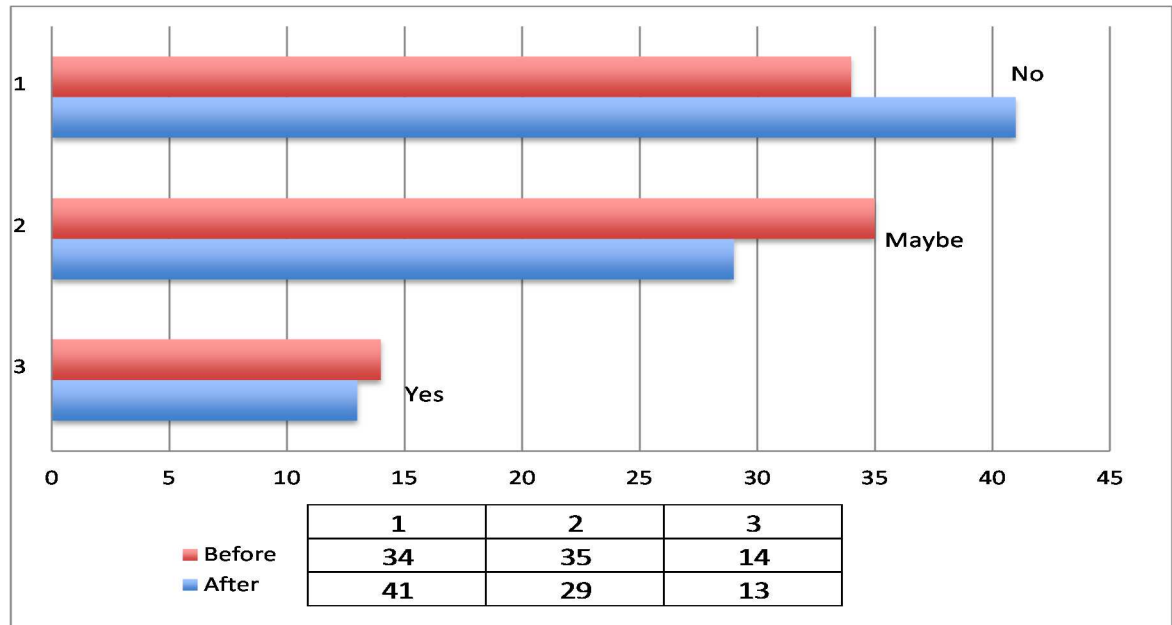


Figure 21 Participants’ purchasing behavior in certified cosmetic products before and after the additional interpretation and an example of the certification were given

An increase in choosing not to buy sustainable cosmetic products that are not certified is seen in the response after the education, as shown in Figure 21. However, the p-value of 0.217 indicates that the difference between before and after the education is not statistically significant. Looking at Q10, Q11 and Q18, Q19 together, it is interesting to find that, although more participants think certification made cosmetic products more

trustable after the education, they do not necessarily decide to purchase a certified cosmetic product in the future. Other factors such as the price, brand and the effectiveness of the products probably play an important role here, which was discussed in section 5.3.5.

5.3.5 The Importance and Ranking of Cosmetic Products Being Sustainable

Questions Q3, Q4 and Q20, Q21 are designed to help understand the importance of “brand”, “quality/effectiveness”, “price”, “being sustainable” when customers choose a cosmetic product, and how they affect their purchase decision.

These four questions state as:

Q3. Q20. How important do you think of the following four factors: price, brand, quality/effectiveness, being sustainable, in terms of your purchase decision for cosmetic products?

7. Extremely important, 6. Very important, 5. Somewhat important, 4. Neither important nor unimportant, 3. Somewhat unimportant, 2. Very unimportant, 1. Not important at all.

Q4. Q21 Please rank the following factors: price, brand, quality/effectiveness, being sustainable, from 1 to 4 in order of importance to your purchase decision for cosmetic products. 1 is the most important and 4 is the least important to you.

Questions Q3 and Q4 were asked after the general demographic questions in Part I of the survey. After answering the questions discussed in previous sections and getting all the education on various aspects of sustainable cosmetic products, participants were again asked the same question in Q20 and Q21. At this point, different perceptions and possibly changing attitudes are expected from the customers towards the importance of the four factors that influence the customers' purchase decision.

The overall ranking of the four factors in terms of customers' purchase decision before and after the education were shown in Table 8 and Table 9. The average ranking was calculated by the following equation:

$$\text{Average ranking} = \frac{\sum \text{ranking number} \times \text{the number of the people}}{83}$$

Table 8 Number of the people ranking the four factors before education

Ranking	1	2	3	4	Average ranking
Factors					N=83
Quality /Effectiveness	60	18	5	0	1.34
Price	13	33	28	9	2.40
Being sustainable	7	18	21	37	3.06
Brand	3	14	29	37	3.20

Table 9 Number of the people ranking the four factors after education

Ranking	1	2	3	4	Average ranking
Factors					N=83
Quality/Effectiveness	19	5	25	0	1.42
Price	8	40	25	10	2.45
Being sustainable	19	15	26	23	2.63
Brand	2	5	26	50	3.50

Table 10 shows the average ranking of “quality/effectiveness”, “price”, “sustainable”, “brand” before and after the education. Although the overall ranking of the four factors remain the same before and after the education, the average ranking value of “Being sustainable” increased from 3.06 to 2.63. “Quality/Effectiveness” and “price” are regarded as the most important two factors regardless of whether a customer is educated on sustainable cosmetic products knowledge, while “brand” is considered as the least important among these four factors.

Table 10 Average ranking value before and after the education

Average ranking Factors	Before	After
Quality/Effectiveness	1.34	1.42
Price	2.40	2.45
Being sustainable	3.06	2.63
Brand	3.20	3.50

Figure 22 shows the rank of “being sustainable” before and after the education.

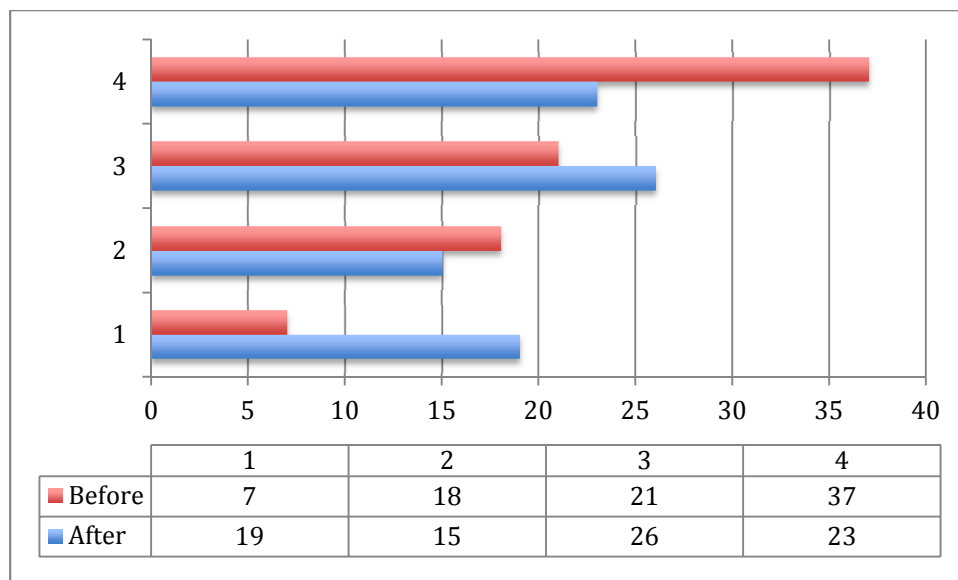


Figure 22 The rank of “being sustainable” before and after the education

An increasing number of respondents (from 7 to 19) in ranking “being sustainable” as the most important factor in terms of their purchase decision can be seen after the education as shown in Figure 5.8. The p-value of 0.0009929 indicates the difference between before and after the education is statistically significant.

Figure 23 shows the importance of “being sustainable” in terms of participants’ purchase decision for cosmetic products before and after the education as asked in questions Q3 and Q20.

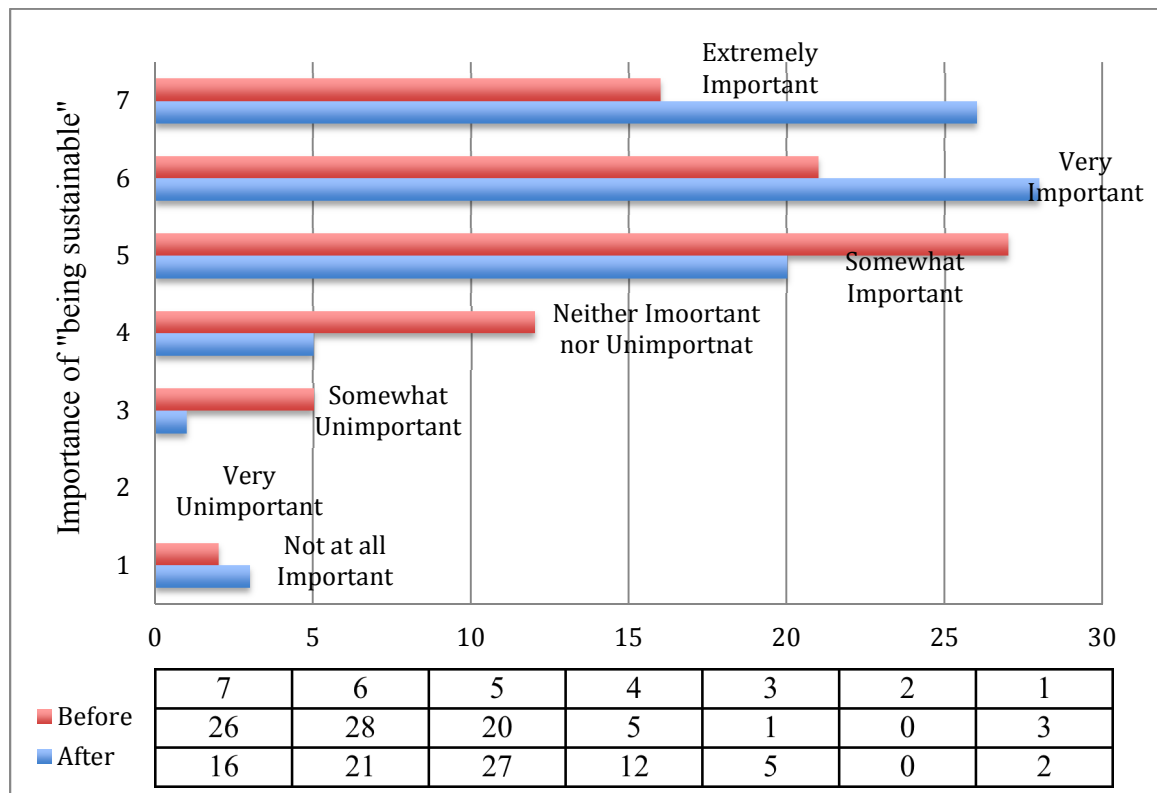


Figure 23 The importance of “being sustainable” in terms of participants’ purchase decision for cosmetic products before and after the education

An increase in choosing “Extremely Important” and “Very Important” of “being sustainable” in terms of participants’ purchase decision for cosmetic products can be seen in the response after the education as shown in Figure 23. Also, the p-value of 0.0001682 indicates such changing between before and after the education is statistically significant.

Table 11 The number of people choosing the importance scores of “being sustainable” in terms of participants’ purchase decision for cosmetic products before and after the education

	7 Extremely important	6 Very important	5 Somewhat important	4 Neither important nor unimportant	3 Somewhat unimportant	2 Very Unimportant	1 Not Important At all	Weighted average (n=83)
Before	16	21	27	12	5	0	2	5.28
After	26	28	20	5	1	0	3	5.73

Table 11 summarized the number of the people choosing the importance of “being sustainable”. The weighted average value of the 83 choices before and after the education can be calculated. An increase can be seen in this value of being 5.73 after the education as compared to the “before” value of 5.28.

The result in this section indicated an increasing awareness of “being sustainable” as an important factor when customers make their purchase decision after the education. However, “quality/effectiveness” and “price” remain to be the most two important factors that influence customers’ choices regardless of whether the customers are educated. Only educating customers on the sustainable related knowledge of the company and products dose not guarantee the success of the business. Sustainable cosmetic companies should take all these four factors into account to make proper business strategies.

5.3.6 Ranking of the Factors in Company Image Building

Based on the discussion in section 4.2, fourteen factors (Table 12) are summarized as crucial in company image building. Participants were asked in question Q22 to indicate the importance of these fourteen items to their purchase decision towards a sustainable cosmetic product, from 1 being “not important at all” to 7 being “extremely important”.

Question Q22 stated as:

Q 22. Please indicate the importance of the following items to your purchase decision towards a sustainable cosmetic product.

Table 12 Fourteen factors that identified crucial in company image building

Number	Factors identified crucial in company image building
1	Raw materials are sourced in an environmentally friendly way.
2	Raw materials are acquired at fair trade prices.
3	The formulation and ingredients of the product are safe and non-toxic.
4	Product manufacturing processes are environmentally friendly.
5	Packaging materials are degradable and recyclable.
6	Packaging is designed in a creative way that reduces the packaging material consumption and/or increases its repeatable use.
7	The company’s corporate social responsibility (CSR) is well presented.
8	The company logo and name are environmentally friendly perceived.
9	The company website clearly communicates its sustainable efforts.
10	The company actively collaborates with environmental groups or charity organizations to help resolve social and environmental issues.
11	Product is certified by a third-party.
12	Company receives positive feedbacks and has good reputation in social medias such as Facebook and Twitter.
13	Beauty bloggers highly recommend of the product or company.
14	Company employees show appropriate behaviors and provide effective communications.

Table 13 shows the number of the people chose the importance for each factor towards their purchase decision when choosing a sustainable cosmetic product, and Table 14 gives the ranking of each factor according to the weighted average value calculated in Table 13.

Table 13 The number of people choosing the importance scores for each factor

Factor	7	6	5	4	3	2	1	Weighted average N=83
1	21	34	21	5	0	0	2	5.76
2	14	32	29	5	0	0	3	5.52
3	39	30	10	2	1	0	1	6.20
4	24	25	24	7	0	0	3	5.65
5	15	23	31	11	0	0	3	5.36
6	12	29	27	11	0	1	3	5.33
7	16	25	24	12	3	1	2	5.34
8	8	10	36	21	2	2	4	4.75
9	9	27	36	7	1	0	3	5.29
10	11	23	32	13	1	1	2	5.23
11	20	29	24	8	0	0	2	5.64
12	14	31	24	10	0	1	3	5.41
13	7	18	33	15	4	3	3	4.86
14	10	22	31	17	2	0	1	5.20

Table 14 The ranking of the fourteen factors in terms of their importance towards customers' purchase decision

Ranking	Number	Factors identified crucial in company image building
1	3	The formulation and ingredients of the product are safe and non-toxic.
2	1	Raw materials are sourced in an environmentally friendly way.
3	4	Product manufacturing processes are environmentally friendly.
4	11	Product is certified by a third-party.
5	2	Raw materials are acquired at fair trade prices.
6	12	Company receives positive feedbacks and has good reputation in social medias such as Facebook and Twitter.
7	5	Packaging materials are degradable and recyclable.
8	7	The company's corporate social responsibility (CSR) is well presented.
9	6	Packaging is designed in a creative way that reduces the packaging material consumption and/or increases its repeatable use.
10	9	The company website clearly communicates its sustainable efforts.
11	10	The company actively collaborates with environmental groups or charity organizations to help resolve social and environmental issues.

12	14	Company employees show appropriate behaviors and provide effective communications.
13	13	Beauty bloggers highly recommend of the product or company.
14	8	The company logo and name are environmentally friendly perceived.

As shown in Table 13 and summarized in Table 14, the most important three factors that influence customers' purchase decision on a cosmetic product are "the formulation and ingredients of the product are safe and non-toxic", "raw materials are sourced in an environmentally friendly", "Product manufacturing processes are environmentally friendly". This indicates that customers pay most of their attention to the quality of the cosmetic product itself including a safe formulation and ingredients. Then they are concerning whether the raw materials sourcing and manufacturing processes are responsible for the environment. These three top concerns also reflect customers' strong demand for a sustainable cosmetic product, which was defined in section 4 as being both sustainable to human beings and to the environment.

Table 14 also shows the three least important factors that impact on customers' purchase decision, which are "Company employees show appropriate behaviors and provide effective communications", "Company employees show appropriate behaviors and provide effective communications", "The company logo and name are environmentally friendly perceived". However, according to the weighted average value shown in Table 13, even the least important factor has a value of 4.75, which is higher than 4 (neither important nor unimportant) indicating that customers do care about those factors and think they are important though not as important as the other factors.

Noted that the weighted average value of each fourteen factors shown in Table 5.10 are quite close, from the highest value of 6.20 to the lowest value of 4.75. They should be all considered as crucial aspects in the company image that would influence on the customers' perception of the company and their purchase decision. The result offers evidence to the sustainable cosmetic companies that all the fourteen factors are important and they should pay attention to when they build company image.

5.4 Summary

This chapter presents the empirical experiments to test the impact of the contributing factors in customer education on customers' purchasing behavior and the importance of the factors to a company's image building.

The results reveal customers' increasing demand for cosmetic products to be sustainable. However, product's quality/effectiveness and price are still the most important factors that influence their final purchase decision. Sustainable cosmetic companies need to take advantages of their sustainable concept but not to compromise the effectiveness and price of the products to create successful branding that customers will adhere to.

On the other hand, although customers have strong demand in purchasing sustainable cosmetic products, there is a lack of safe formulation and ingredient knowledge in

identifying real sustainable products. Sustainable cosmetic companies at this point should pay close attention to incorporate customer education into their core business strategy to equip customers to differentiate true sustainable cosmetic products they offer from the others.

Building a sustainable image helps cosmetic company gain more trust and build long term loyalty in their customers. By reshaping the company identity through adjusting managerial practices and by improving product development, a reduced cost can be also obtained in the long run. For the customers to view a cosmetic company as sustainable, all the fourteen factors identified and discussed in section 4.2 are important. But the formulation and ingredients, sourcing of materials and the manufacturing process of the products being safe and environmentally friendly are the most important.

6. Conclusion

Since it was first proposed in 1987, “sustainability” has been given more and more importance by companies in setting business strategies for long-term success with an aim to not sacrificing environment and harming human health. Innovation through sustainability provides companies opportunities to re-think their managerial practices, product development and marketing strategies. Current research focuses on how sustainable innovations can bring companies success but did not discuss how companies can facilitate its own sustainable innovations. To bridge this gap, this study presented an in-depth investigation in the cosmetic industry. Looking at the current situation in the cosmetic industry, the lack of mature regulation on natural and organic cosmetic products in the U.S. represents a challenge but also an opportunity to the sustainable cosmetic companies. “Customer education,” “company image building,” and “strategic alliance” are three key factors that sustainable cosmetic companies need to pay close attention to. Deliberate strategies need to be employed to facility these three components in a sustainable cosmetic company’s business plan. .

Limitations of this research include that the investigation was based on the cosmetic industry. Other industries can be studied in the future to further shed light on the successful diffusion of sustainable innovations. The analysis also omitted the sustainable supply chain component, as it is a huge topic by itself. The survey conducted in this research only serves as a pilot study and can be further improved in terms of its questionnaire design as well as the sample size.

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Appendix: Survey Questionnaire

PART 1

1. What is your gender?

- Male
- Female
- I choose not to say

2. What is your age group?

- 15-25
- 26-35
- 36-45
- 46-55
- 56-65
- 66 and over

3. How important do you think of the following four factors in terms of your purchase decision for cosmetic products?

	Effectiveness /Quality	Price	Brand	Being Sustainable
Extremely Important				
Very Important				
Somewhat Important				
Neither Important nor Unimportant				
Somewhat Unimportant				
Very Unimportant				
Not at all Important				

4. Please rank the following factors from 1 to 4 in order of importance to your purchase decision for cosmetic products 1 is the most important and 4 is the least important to you.

Effectiveness/Quality	
Price	
Brand	
Being Sustainable	

5. While choosing a cosmetic product, do you check to see its ingredients?

- Always

- Sometimes
 - Never
6. Do you avoid cosmetic products that contain hazardous ingredients?
- Always
 - Sometimes
 - Never
 - I don't know what ingredients are considered hazardous
7. Have you used any sustainable cosmetic products?
- Yes
 - No
 - I am not sure
8. Are you currently using any sustainable cosmetic products?
- Yes
 - No
 - I am not sure
9. Will you purchase a sustainable cosmetic product in the next two years?
- Yes
 - No
 - I am not sure
10. In your opinion, how do sustainable cosmetic products that are certified by an independent third party compare to those with no certification?
- Certifications made the products more trustable
 - Certifications made no difference
 - Certifications made the products less trustable
11. If you are considering buying a sustainable cosmetic product, will you purchase one that is not certified?
- Yes
 - Maybe
 - No

PART 2

Do you know that there are some hazardous ingredients in the cosmetic products that are suggested to be avoided? Based on the possibility of leading to cancer, endocrine disruption, allergies/ immunotoxicity, biochemical or cellular level changes, etc., these ingredients are rated on a 0-10 scale in terms of their hazardous levels, as shown in the following Table 1. For example, parabens, such as *methylparaben* and *propylparaben* in Table 1, have been shown to be related to breast cancer.

Table 1. Examples of ingredients at different hazardous levels

0-2 Low hazard	3-6 Moderate hazard	7-10 High hazard
Paraffin EDTA Sulfur	Dimethicone Methylparaben Petroleum/Mineral Oil	Fragrance Propylparaben Oxybenzone

Source: EWG's Skin Deep Cosmetics Database

12. Next time when you are purchasing a cosmetic product, will you check to see its ingredients?

- Yes
- Maybe
- No

The use of *parabens* as the preservative in cosmetic products has arose a lot of concerns due to possible endocrine, hormonal disruption as well as breast cancer. Nowadays, more and more cosmetic brands including Origins, Burt's bee, and Bareminerals claim their products as parabens-free. But there are still considerable amount of cosmetic products such as some products from Kiehl's, Cetaphil, Aveeno, Covergirl, L'Oreal Paris, Maybelline, Revlon, etc. containing those hazard ingredients.

13. Suppose a cosmetic product that you are currently using contains a highly hazardous ingredient such as *propylparaben*, will you still use it?

- Yes
- Maybe
- No

14. Will you avoid cosmetic products that contain hazardous ingredients in the next two years?

- Yes
- Maybe
- No

A cosmetic product can be called sustainable if: 1.) it is sustainable for the users—it has no short- and long-term potential hazardous impact on the users; and 2.) it is produced from a sustainable production processes that is environmentally friendly and sources raw material, formulates, manufactures, packs, distributes, and markets the products in an ethical way.

15. Have you used any sustainable cosmetic products?

- Yes
- No
- I am not sure

16. Are you currently using any sustainable cosmetic products?

- Yes
- No
- I am not sure

17. Will you purchase a sustainable cosmetic product in the next two years?

- Yes
- No
- I am not sure

Certain standards for organic and natural cosmetic products have been set up by a few





third-party organizations in the U.S. such as USDA , NSF  and NPA . A third-party certification means that an independent organization has reviewed the manufacturing process of a product and has independently determined that the final product complies with specific standards for safety, quality or performance. For example, Table 2 below shows examples and detailed explanation on the definition given by NPA for its certified products.

Table 2. NPA certification of cosmetic products

Organization	Explanation	Featured Certified Products
 NPA (Natural Product Association)	<ul style="list-style-type: none"> • Natural Ingredients: A product labeled "natural" should be made up of only, or at least almost only, natural ingredients and be manufactured with appropriate processes to maintain ingredient purity. • Safety: A product labeled "natural" should avoid any ingredient with a suspected human health risk. • Responsibility: A product labeled "natural" should use no animal testing in its development. • Sustainability: A product labeled "natural" 	<ul style="list-style-type: none"> • Burt's Bee • Himalaya • CARA B Natural Products

	should use biodegradable ingredients and the most environmentally sensitive packaging.	
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18. How do you think about sustainable cosmetic products that are certified by an independent third party as compared to those with no certification?

- Certifications made the products more trustable
- Certifications made no difference
- Certifications made the products less trustable

19. If you are considering buying a sustainable cosmetic product, will you purchase one that is not certified?

- Yes
- Maybe
- No

20. Overall, how important do you think of the following four factors in terms of your purchase decision for cosmetic products?

	Effectiveness /Quality	Price	Brand	Being Sustainable
Extremely Important				
Very Important				
Somewhat Important				
Neither Important nor Unimportant				
Somewhat Unimportant				
Very Unimportant				
Not at all Important				

21. Please rank the following factors from 1 to 4 in order of importance to your purchase decision for cosmetic products 1 is the most important and 4 is the least important to you.

Effectiveness/Quality	
Price	
Brand	
Being Sustainable	

22. Please indicate the importance of the following items to your purchase decision towards a sustainable cosmetic product.

7 Extremely important	6 Very important	5 Somewhat important	4 Neither important nor unimportant	3 Somewhat unimportant	2 Very Unimportant	1 Not Important At all
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Raw materials are sourced in an environmentally friendly way.	
Raw materials are acquired at fair trade prices.	
The formulation and ingredients of the product are safe and non-toxic.	
Product manufacturing processes are environmentally friendly.	
Packaging materials are degradable and recyclable.	
Packaging is designed in a creative way that reduces the packaging material consumption and/or increases its repeatable use.	
The company's corporate social responsibility (CSR) is well presented.	
The company logo and name are environmentally friendly perceived.	
The company website clearly communicates its sustainable efforts.	
The company actively collaborates with environmental groups or charity organizations to help resolve social and environmental issues.	
Product is certified by a third-party.	
Company receives positive feedbacks and has good reputation in social medias such as Facebook and Twitter.	
Beauty bloggers highly recommend of the product or company.	
Company employees show appropriate behaviors and provide effective communications.	